Extron® Electronics
INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual

MVX Plus 128

VGA Matrix Switchers

68-521-30 **Rev. A**
12 05

Precautions

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Avertissement

Alimentations• Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

安全须知 • 中文

这个符号提示用户该设备用户手册中有重要的操作和维护说明。

这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

警告

电源 • 该设备只能使用产品上标明的电源。 设备必须使用有地线的供电系统供电。 第三条线（地线）是安全设施，不能不用或跳过 。

拔掉电源 • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

电源线保护 • 妥善布线， 避免被踩踏，或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。 设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。 不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

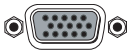
Quick Start — MVX Plus 128 VGA Matrix Switchers

Installation

Step 1

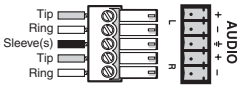
Turn off power to the input and output devices, and remove the power cords from them.

Step 2 — Inputs



a. Connect up to 12 high resolution video inputs to the 15-pin HD input connectors.

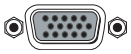
b. Connect up to 12 stereo or mono audio inputs to the 5-pin captive screw connectors.



Balanced Input
(high impedance)

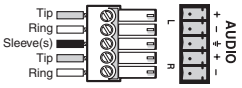
Unbalanced Input
(high impedance)

Step 3 — Outputs

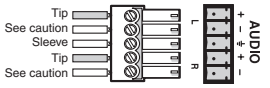


a. Connect up to 8 high resolution video devices to the 15-pin HD output connectors.

b. Connect up to 8 balanced or unbalanced stereo audio or mono audio devices to the 5-pin captive screw connectors.



Balanced Output

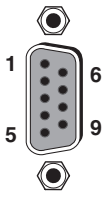


Unbalanced Output

CAUTION *Connect the sleeve to ground. Connecting the sleeve to a negative (-) terminal will damage the audio output circuits.*

Step 4 — RS-232/RS-422

If desired, connect a control system or computer to the Remote RS-232/RS-422 port.



Pin	RS-232	Function	RS-422	Function
1	—	Not used	—	Not used
2	TX	Transmit	TX–	Transmit (–)
3	RX	Receive	RX–	Receive (–)
4	—	Not used	—	Not used
5	Gnd	Ground	Gnd	Ground
6	—	Not used	—	Not used
7	—	Not used	RX+	Receive (+)
8	—	Not used	TX+	Transmit (+)
9	—	Not used	—	Not used

Step 5 — Ethernet

If desired, connect a network WAN or LAN hub, a control system, or computer to the Ethernet RJ-45 port. See chapter 2, *Installation*, for details.

- **Network connection** — Wire as a patch (straight) cable.
- **Computer or control system connection** — Wire the interface cable as a crossover cable.

Step 6 — Power

Plug the switcher into a grounded AC source.

Definitions

Tie — An input-to-output connection.

Set of ties — An input **tied** to 2 or more outputs.

Configuration — One or more **ties** or **sets of ties**.

Current configuration — The currently active **configuration** (also called **configuration 0**).

Global preset — A **configuration** that has been stored. One **global preset** can be assigned to each input button. When a **global preset** is retrieved from memory, it becomes the **current configuration**.

Front Panel Controls

Input and output buttons select inputs and outputs. Output buttons light **amber** to indicate video and audio ties. The buttons light **green** to indicate video-only ties. The buttons light **red** to indicate audio-only ties. Input and output buttons also select presets.

The output buttons also display the selected input's audio level.

The input buttons also display the selected output's volume level.

Enter button saves changes.

Preset button saves a configuration as a preset or recalls a previously-defined preset.

View button selects a view-only mode that prevents inadvertent configuration changes. On audio models, View decrements the level and volume. See *Viewing and adjusting the audio level* on QS-2.

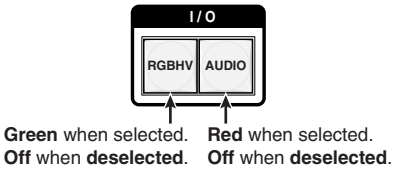
Quick Start —
MVX Plus 128 VGA Matrix Switchers, continued

Esc button cancels selections in progress and resets the front panel button indications. The Esc button does **not** reset: the current configuration, the RGBHV and audio selection, any presets, or any audio level or volume settings. On audio models, Esc increments the level and volume. See *Viewing and adjusting the audio level* in the next column.

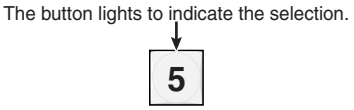
RGBHV and Audio buttons select/deselect video and/or audio. The Audio button blinks to indicate audio breakaway. The Audio button also selects the audio level/adjust mode. See *Viewing and adjusting the audio level* in the next column.

Create a tie

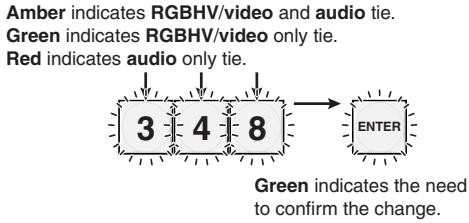
1. Press and release the RGBHV/Video and/or Audio I/O button(s) to select or deselect video and/or audio as desired.



2. Press and release the desired input button.



3. Press and release the desired output button(s).

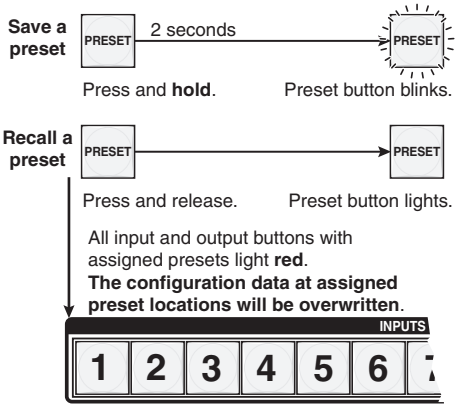


4. Press and release the Enter button.

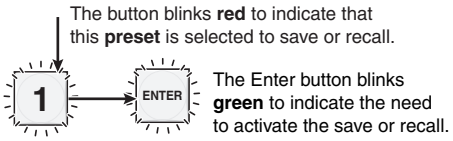
Saing or recalling a preset

1. **Save** a preset — Press and **hold** the Preset button for 2 seconds.

   Recall a preset — Press and release the Preset button.



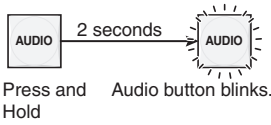
2. Press and release the desired input or output button.


The button blinks red to indicate that this preset is selected to save or recall.
1
ENTER
The Enter button blinks green to indicate the need to activate the save or recall.

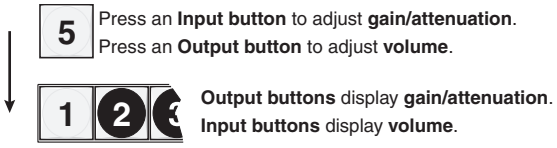
3. Press and release the Enter button.

Viewing and adjusting the audio level

1. Press and **hold** the Audio button.

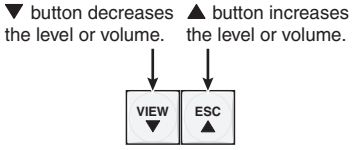


2. Press an input or output button. See chapter 3 to read the displayed value.



3. Increase and decrease the gain/attenuation or volume level by pressing the Esc (▲) and View (▼) buttons.

4. Press and release the Audio button to exit.



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1

Chapter One

Introduction

About this Manual

About the Matrix Switchers

Definitions

Features

Installation

About this Manual

This manual contains installation, configuration, and operating information for the Extron MVX Plus 128 12-input by 8-output wideband computer video (VGA) and audio matrix switcher.

About the Matrix Switchers

The MVX matrix switcher distributes any of 12 inputs to any combination of 8 outputs. The matrix switcher can route multiple input/output configurations simultaneously.

The matrix switcher is a single box solution to complex wideband (figure 1-1) video and/or audio routing applications. Each input and output is individually isolated and buffered, and any input(s) can be switched to any one or all outputs with virtually no crosstalk or signal noise between channels.

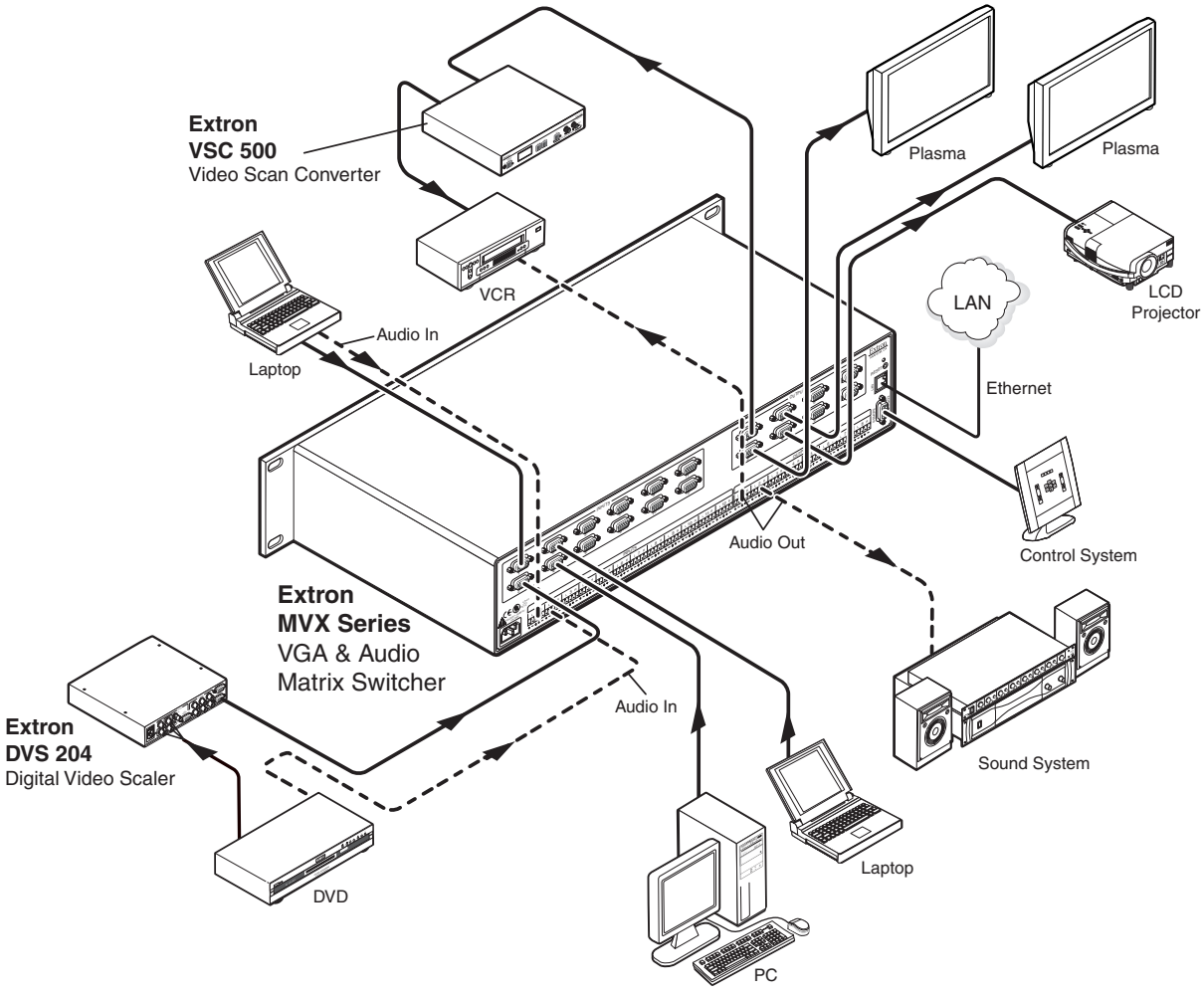


Figure 1-1 — Typical MVX Plus 128 A matrix switcher application

The MVX Plus 128 inputs and outputs VGA video on 15-pin HD connectors and audio on 3.5 mm, 5-pole captive screw terminals.

The audio switching can be either linked with the video (audio follow) or be independent of the video (audio breakaway). Adjustable input audio gain and attenuation compensates for level differences between audio inputs.

The matrix switcher can be remotely controlled via its Ethernet port and its RS-232/RS-422 port. The matrix switcher is programmed with Extron's Simple Instruction Set™ (SIS™), a set of basic ASCII code commands that provide simple control through a control system or PC without programming long, obscure strings of code. SIS commands can be entered via either the Ethernet link or the RS-232/RS-422 link.

The Ethernet port can be connected through a local area network (LAN) or wide area network (WAN).

The MVX Plus 128 features e-mail notification of maintenance or other concerned personnel concerning the status of the power supplies and the loss or resumption of sync on individual inputs.

The RS-232/RS-422 port can be connected to a control system, a PC, or Extron's MCP 1000 remote control panel and/or MKP 1000 remote keypad.

The matrix switchers are housed in rack-mountable, 2U high metal enclosures with mounting flanges for standard 19" racks. The appropriate rack mounting kit is included with the switcher.

The switcher has an internal 100 VAC to 240 VAC, 50/60 Hz, 15 watts autoswitchable power supply that provides worldwide power compatibility.

The MVX Plus 128 has a minimum bandwidth of 300 MHz (-3 dB). Both models can also switch RGBS, RGsB, RsGsBs, HDTV, component video, S-video, and composite video.

Definitions

The following terms, which apply to Extron matrix switchers, are used throughout this manual:

Tie — An input-to-output connection.

Set of ties — An input **tied** to two or more outputs. (An output can never be tied to more than one input.)

Configuration — One or more **ties** or one or more **sets of ties**.

Current configuration — The **configuration** that is currently active in the switcher (also called **configuration 0**)

Global memory preset — A **configuration** that has been stored. Up to 32 **global memory presets** can be stored in memory. Preset locations are assigned to the input buttons and (where necessary) output buttons. Up to 20 presets can be selected from the front panel for either saving or retrieving. When a **preset** is retrieved from memory, it becomes the **current configuration**. All models have 32 presets; preset numbers larger than 20 are still accessible under RS-232/RS-422 or Ethernet control.

Features

Video — The switchers input and output RGBHV or RGBS (VGA) video on 15-pin HD connectors. They can also switch RGsB, RsGsBs, component/HDTV, S-video, or composite video.

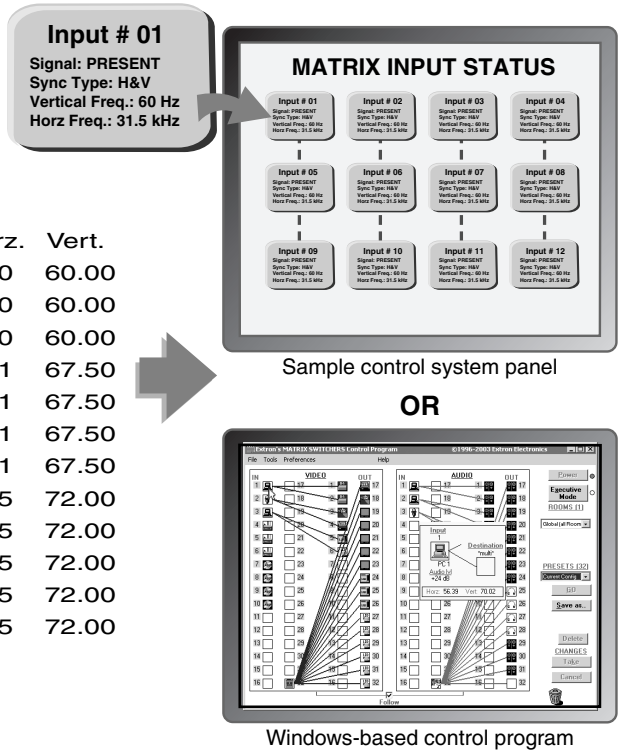
Bandwidth — The MVX switchers provide a minimum of 300 MHz (-3 dB) video bandwidth, fully loaded.

Audio inputs — Input and output stereo audio, balanced or unbalanced, is provided on 3.5 mm, 5-pole captive screw terminals.

Audio input gain/attenuation — Individual input audio levels can be adjusted so there are no noticeable volume differences between sources. Users can set the input level of audio gain or attenuation (-18 dB to +24 dB) via the Ethernet link, RS-232/RS-422 link, or the front panel.

Audio output volume — The audio volume of each output can be displayed and adjusted through a range of full output to completely silent, from the front panel or under RS-232/RS-422 or Ethernet control.

Digital Sync Validation Processing (DSVP™) — In critical environments or unmanned, remote locations, it may be vital to know that sources are active and switching. Extron's DSVP confirms that input sources are active by scanning all sync inputs for active signals. DSVP provides instantaneous frequency feedback for composite sync or separate horizontal and vertical sync signals via the switcher's RS-232/RS-422 or Ethernet port. The frequency information can be displayed on any control system or in a Windows®-based control program on a local-area network (LAN) or Internet (IP) connection (figure 1-2).



Input	Horz.	Vert.
01	31.50	60.00
02	31.50	60.00
03	31.50	60.00
04	48.01	67.50
05	48.01	67.50
06	48.01	67.50
07	48.01	67.50
08	61.55	72.00
09	61.55	72.00
10	61.55	72.00
11	61.55	72.00
12	61.55	72.00

Figure 1-2 — DSVP data display

Rooming — Each switcher can be programmed to group multiple outputs to specific "rooms", allowing them to have their own presets.

Switching flexibility — Provides individually buffered, independent matrix switched outputs with audio follow and audio breakaway for audio models.

- **Tie any input to any or all outputs**
- **Quick multiple tie —** Multiple inputs can be switched to multiple outputs simultaneously. This allows all displays (outputs) to change from source to source at the same time.
- **Audio follow —** Audio can be switched with its corresponding video input via front panel control or under Ethernet or RS-232/RS-422 remote control.
- **Audio breakaway —** Audio can be broken away from its corresponding video signal. This feature allows any audio signal to be selected with any video signal simultaneously to one or all outputs in any combination. Audio breakaway switching can be done via front panel control or under Ethernet or RS-232/RS-422 remote control.

Operational flexibility — Operations such as input/output selection, setting of presets, and adjustment of audio levels can be performed on the front panel or via the Ethernet or RS-232/RS-422 link. The RS-232/RS-422 links allow remote control via a PC or control system. The Ethernet link allows multiple remote links with two levels of password protection.

- **Front Panel Controller** — The front panel controller supports input and output selection, I/O grouping, preset creation and selection, RGB delay, and audio gain and attenuation and volume control (audio models). The front panel features illuminated pushbuttons that can be labeled with text or graphics.
- **Windows-based control program —** For RS-232/RS-422 remote control from a PC, the Extron Windows-based control software provides a graphical interface and drag-and-drop/point-and-click operation. The Windows-based control program also has an emulation mode that lets you create a switcher configuration file at the home office and then download it for use by the switcher on site.
- **Simple Instruction Set (SIS™) —** The remote control protocol uses Extron's SIS for easy programming and operation.
- **Remote control panels and keypads —** The matrix switchers are remote controllable, using the optional MKP 2000 and MKP 3000 remote control keypads. The remote control devices are easy to use and provide tactile buttons for quick selection.

Upgradeable firmware — The firmware that controls all switcher operation can be upgraded in the field via RS-232/RS-422 or Ethernet, without taking the switcher out of service. Firmware upgrades are available for download on the Extron Web site, www.extron.com, and they can be installed using the Windows-based control program.

Labeling — Extron's included label software lets you create labels to place in the front panel I/O buttons, with names, alphanumeric characters, or color bitmaps for easy and intuitive input and output selection. Alternatively, labels can be made with any Brother™ P-Touch™ or comparable labeler.

Global memory presets — 32 global memory presets are a time-saving feature that lets you set up and store input/output configurations in advance. 20 global memory presets are available from the front panel. You can then recall those configurations, when needed, with a few simple steps.

Rack mounting — Rack mountable in any conventional 19" wide rack.

Front panel security lockout (*Executive* mode) — If a matrix switcher is installed in an open area, where operation by unauthorized personnel may be a problem, a security lockout feature can be implemented. When the front panel is locked, a special button combination or SIS command is required to unlock the front panel controller before it can be operated.

I/O grouping — Allows the matrix to be virtually divided into smaller sub-switchers, making installation and control easier. I/O grouping allows specific outputs, such as those designated for a specific purpose, to be grouped together.

Power — The matrix switcher's 100 VAC to 240 VAC, autoswitchable, internal power supply provides worldwide power compatibility.

Chapter Two

Installation

Mounting the Switcher

Cabling and Rear Panel Views

Installation

Mounting the Switcher

The matrix switchers are housed in rack-mountable, 2U high metal enclosures with mounting flanges for standard 19" racks. If desired, rack mount the switcher as follows:

1. Insert the switcher into the rack, aligning the holes in the mounting bracket with those in the rack.
2. Secure the switcher to the rack using the supplied bolts.

Cabling and Rear Panel Views

All connectors are on the rear panel. Figure 2-1 shows the MVX Plus 128 A.

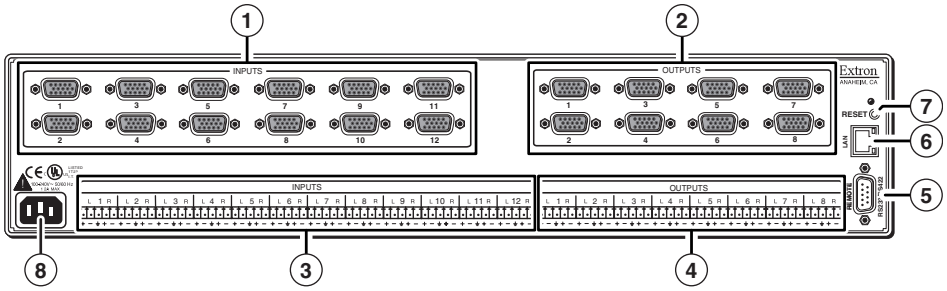


Figure 2-1 — MVX Plus 128 A video and audio matrix switcher

CAUTION *Use Electrostatic discharge precautions (be electrically grounded) when making connections. Electrostatic discharge (ESD) can damage equipment, even if you cannot feel, see, or hear it.*

CAUTION *Remove system power before making all connections.*

Video connections

NOTE *The switchers do not alter the video signal in any way. The signal output by the switcher is in the same format as the input.*

NOTE *The MVX Plus 128 switchers can also switch RGBS, RGsB, RsGsBs, component video, S-video, or composite video by using the appropriate adapters.*

① **RGB video inputs —** Connect the analog computer-video sources to these 15-pin HD female connectors.

NOTE *Most laptop or notebook computers have an external video port, but they require special commands to output the video to that connector. Also, a laptop's screen shuts off once that port is activated. See the computer's user's guide for details, or contact Extron for a list of common laptop keyboard commands.*

② **RGB video outputs** — Connect RGBHV video displays to these 15-pin HD female connectors for each output.

Audio connections

By default, the audio ties follow the video ties. Audio breakaway, which can be activated via the front panel or under Ethernet or RS-232/RS-422 control, allows you to select from any one of the audio input sources and route it separately from its corresponding video source. See chapter 3, *Operation*, chapter 4, *Programmer's Guide*, chapter 5, *Switcher Software*, and chapter 6, *HTML Operation* for details.

③ **Connections for balanced and unbalanced audio inputs —** Each input has a 3.5 mm, 5-pole captive screw connector for balanced or unbalanced stereo audio input. Connectors are included with each switcher, but you must supply the audio cable. See figure 2-2 to wire a connector for the appropriate input type and impedance level. High impedance is generally over 800 ohms.

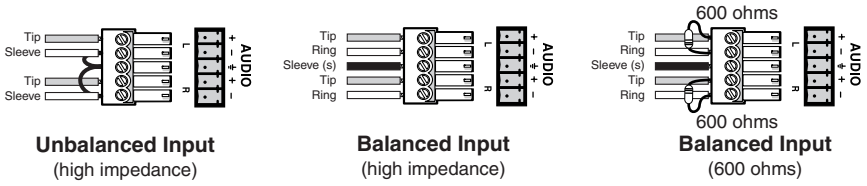


Figure 2-2 — Captive screw connector wiring for audio inputs

CAUTION *The captive screw audio connector can easily be inadvertently plugged partially into one receptacle and partially into an adjacent receptacle. This misconnection could damage the audio output circuits. Ensure that the connector is plugged fully and only into the desired input or output.*

NOTE *See figure 2-3 to identify the tip, ring, and sleeve when you are making connections for the switcher from existing audio cables. A mono audio connector consists of the tip and sleeve. A stereo audio connector consists of the tip, ring and sleeve. The ring, tip, and sleeve wires are also shown on the captive screw audio connector diagrams, figure 2-2 and figure 2-4.*

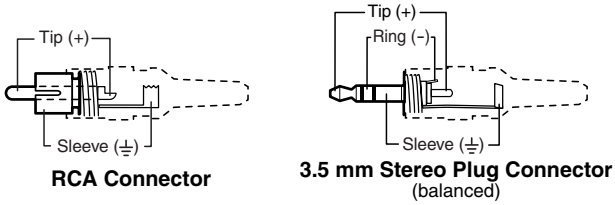


Figure 2-3 — Typical audio connectors

The audio level for each input can be individually set via the front panel or Ethernet or RS-232/RS-422 control to ensure that the level on the output does not vary from input to input. See chapter 3, *Operation*; chapter 4, *Programmer's Guide*; chapter 5, *Switcher Software*; and chapter 6, *HTML Operation* for details.

④ **Connections for balanced and unbalanced audio outputs —** These 3.5 mm, 5-pole captive screw connectors output the selected unamplified, line level audio. Connect audio devices, such as an audio amplifier or powered speakers. See figure 2-4 to properly wire an output connector.

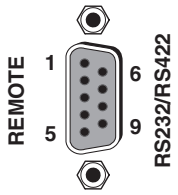
Figure 2-4 — Captive screw connector wiring for audio output

CAUTION *Connect the sleeve to ground (Gnd). Connecting the sleeve to a negative (-) terminal will damage the audio output circuits.*

The volume level for each output can be individually set via the front panel or Ethernet or RS-232/RS-422 control. See chapter 3, *Operation*; chapter 4, *Programmer's Guide*; chapter 5, *Switcher Software*; and chapter 6, *HTML Operation* for details.

RS-232/RS-422 connection

⑤ **RS-232/RS-422 connector —** Connect a host device, such as a computer, touch panel control, or RS-232 capable PDA to the switcher via this 9-pin D connector for serial RS-232/RS-422 control (figure 2-5).



Pin	RS-232	Function	RS-422	Function
1	—	Not used	—	Not used
2	TX	Transmit data	TX–	Transmit data (–)
3	RX	Receive data	RX–	Receive data (–)
4	—	Not used	—	Not used
5	Gnd	Signal ground	Gnd	Signal ground
6	—	Not used	—	Not used
7	—	Not used	RX+	Receive data (+)
8	—	Not used	TX+	Transmit data (+)
9	—	Not used	—	Not used

Figure 2-5 — RS-232/RS-422 connector

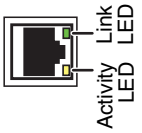
See chapter 4, *Programmer's Guide*, for definitions of the SIS commands (serial commands to control the switcher via this connector) and chapter 5, *Matrix Software*, for details on how to install and use the control software.

NOTE *The switcher can support either the RS-232 or RS-422 serial communication protocol, and operate at 9600, 19200, 38400, or 115200 baud rates. See* Selecting the RS-232/RS-422 protocol and baud rate *in chapter 3,* Operation, *to configure the RS-232/RS-422 port from the front panel.*

If desired, connect an MKP 2000 or MKP 3000 remote control panel to the switcher's RS-232/RS-422 connector. Refer to the *MKP 2000 Remote Control Panel User's Manual* and the *MKP 3000 User's Manual* for details.

Ethernet connection

⑥ **Ethernet port** — If desired, connect the matrix switcher to a PC or to an Ethernet LAN, via this RJ-45 connector. You can use a PC to control the networked switcher with SIS commands from anywhere in the world. You can also control the switcher from a PC that either is running Extron's windows-based control program or has downloaded HTML pages from the switcher.



Ethernet connection indicators — The Link and Act LEDs indicate the status of the Ethernet connection. The Link LED indicates that the switcher is properly connected to an Ethernet LAN. This LED should light steadily. The Act LED indicates transmission of data packets on the RJ-45 connector. This LED should flicker as the switcher communicates.

Cabling and RJ-45 connector wiring

It is vital that your Ethernet cables be the correct cables, and that they be properly terminated with the correct pinout. Ethernet links use Category (CAT) 5e or CAT 6, unshielded twisted pair (UTP) or shielded twisted pair (STP) cables, terminated with RJ-45 connectors. Ethernet cables are limited to a length of 328' (100 m).

NOTE *Do not use standard telephone cables. Telephone cables do not support Ethernet or Fast Ethernet.*

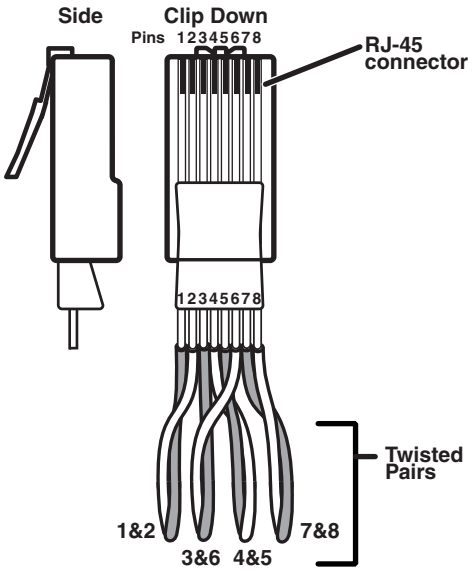
Do not stretch or bend cables. Transmission errors can occur.

The cable used depends on your network speed. The switcher supports both 10 Mbps (10Base-T — Ethernet) and 100 Mbps (100Base-T — Fast Ethernet), half-duplex and full-duplex Ethernet connections.

- 10Base-T Ethernet requires CAT 3 UTP or STP cable at minimum.
- 100Base-T Fast Ethernet requires CAT 5e UTP or STP cable at minimum.

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (figure 2-6).

- **Crossover cable** — Direct connection between the computer and the MVX Plus 128 switcher
- **Patch (straight) cable** — Connection of the MVX Plus 128 switcher to an Ethernet LAN



Patch (straight) cable

Side 1		Side 2	
Pin	Wire color	Pin	Wire color
1	White-orange	1	White-orange
2	Orange	2	Orange
3	White-green	3	White-green
4	Blue	4	Blue
5	White-blue	5	White-blue
6	Green	6	Green
7	White-brown	7	White-brown
8	Brown	8	Brown

Crossover cable

Side 1		Side 2	
Pin	Wire color	Pin	Wire color
1	White-orange	1	White-green
2	Orange	2	Green
3	White-green	3	White-orange
4	Blue	4	Blue
5	White-blue	5	White-blue
6	Green	6	Orange
7	White-brown	7	White-brown
8	Brown	8	Brown

Figure 2-6 — RJ-45 connector and pinout tables

Reset button

⑦ **Reset button** — The Reset button initiates four levels of reset to the matrix switcher. Press and hold the button while the switcher is running or while you power up the switcher for different reset levels.

See *Rear Panel Controls* in chapter 3, *Operation*, for details.

- **Events (mode 3) reset** — Hold Reset for 3 seconds, then release it and push it again to toggle events monitoring on and off.
- **IP settings (mode 4) reset** — Hold Reset for 6 seconds, then release it and push it again to reset the switcher's IP functions.

NOTE *The IP settings reset does not replace any user-installed firmware.*

- **Absolute (mode 5) reset** — Hold Reset for 9, seconds then release it and push it again to restore the switcher to the default factory conditions.
- **Hard reset** — Hold Reset while powering up the switcher to restore the switcher to the default factory conditions.

Power connection

⑧ **AC power connector —** Plug a standard IEC power cord into this connector to connect the switcher to a 100 VAC to 240 VAC, 50 or 60 Hz power source.

3

Chapter Three

Operation

Front Panel Controls and Indicators

Front Panel Operations

Rear Panel Controls

Optimizing the Audio

Troubleshooting

Configuration Worksheets

Operation

Front Panel Controls and Indicators

The front panel controls (figure 3-1) are grouped into two sets. The input and output buttons are grouped on the left side of the control panel. The control buttons and video/audio (I/O) selection buttons are grouped on the right side of the panel.

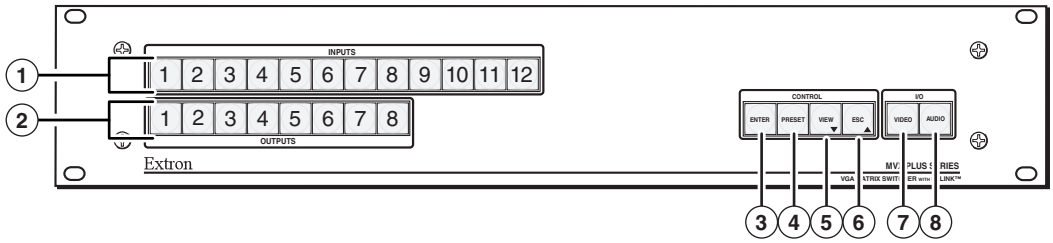


Figure 3-1 — Front panel, MVX Plus 128 A

The large, illuminated push buttons can be labeled with text and/or graphics. The buttons can be set to provide amber background illumination all the time or the background illumination can be turned off (see *Background illumination*, on page 3-39. The buttons blink or are lit at full intensity (depending on the operation) when selected.

Definitions

The following terms, which apply to Extron matrix switchers, are used throughout this manual:

Tie — An input-to-output connection.

Set of ties — An input **tied** to two or more outputs. (An output can never be tied to more than one input.)

Configuration — One or more **ties** or one or more **sets of ties**.

Current configuration — The **configuration** that is currently active in the switcher (also called **configuration 0**)

Global memory preset — A **configuration** that has been stored. Up to 32 **global memory presets** can be stored in memory. Preset locations are assigned to the input buttons and output buttons. Up to 20 presets can be selected from the front panel for either saving or retrieving. When a **preset** is retrieved from memory, it becomes the **current configuration**. All models have 32 presets; preset numbers higher than 21, too high to be available from the front panel are still accessible under RS-232/RS-422 or Ethernet control.

Room — A subset of outputs that are logically related to each other, as determined by the operator. The switchers support up to 10 **rooms**, each of which can consist of from 1 to 16 outputs.

Room memory preset — A **configuration** consisting of outputs in a single **room** that has been stored. When a **room preset** is retrieved from memory, it becomes the **current configuration**.

Input and output buttons

NOTE *If the switcher has fewer inputs or outputs than input or output buttons, only the buttons for which the switcher has an input or output perform the function of selecting and identifying that input or output.*

① **Input buttons —** The input buttons have two primary functions (•) and four secondary (❑) functions:

- Select an input.
- Identify the selected input.

❑ **(Input 1 only)** With the Output 1 button, select *I/O Group* mode. See *I/O grouping* on page 3-17.

❑ Select a preset. See *Using presets* on page 3-23.

❑ Display the RGB delay. See *Setting RGB delay* on page 3-21.

❑ Display the output volume level. See *Viewing and adjusting the output volume* on page 3-33.

② **Output buttons —** The output buttons have two primary functions (•) and four secondary (❑) functions:

- Select output(s).
- Identify the selected output(s).

❑ **(Output 1 only)** With the Input 1 button, select *I/O Group* mode. See *I/O grouping* on page 3-17.

❑ Select a preset. See *Using presets* on page 3-23.

❑ Mute the output. See *Muting and unmuting video and/or audio outputs* on page 3-26.

❑ Display the audio level of the selected input. See *Viewing and adjusting the input audio level* on page 3-29.

Control buttons

③ **Enter button —** The Enter button has three primary functions (•) and five secondary (❑) functions:

- Save changes that you make on the front panel. To create a simple configuration:
  - ❍ Specify RGBHV, audio, or both (see I/O selection buttons [⑦] and [⑧]).
  - ❍ Press the desired input button (①).
  - ❍ Press the desired output button(s) (②).
  - ❍ Press the Enter button.
- Indicate that a potential tie has been created but not saved.
- Indicate that a global preset has been selected to be saved or recalled but that the preset action has not been accomplished.

❑ In the *I/O Group* mode, select group 1. See *I/O grouping* on page 3-17.

❑ In the *I/O Group* mode, indicate that group 1 is selected. See *I/O grouping* on page 3-17.

❑ With the Preset, View, and Esc buttons, select *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.

- ❏ Select 9600 baud for the RS-232/RS-422 port in *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.
- ❏ Indicate that the RS-232/RS-422 port is set to 9600 baud in *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.

④ **Preset button —** The Preset button has two primary functions (•) and five secondary (❏) functions:

- Activates *Save Preset* mode to save a configuration as a preset and *Recall Preset* mode to activate a previously-defined preset.
- Blinks when *Save Preset* mode is active and lights steadily when *Recall Preset* mode is active.
- ❏ In the *I/O Group* mode, select group 2. See *I/O grouping* on page 3-17.
- ❏ In the *I/O Group* mode, indicate that group 2 is selected. See *I/O grouping* on page 3-17.
- ❏ With the Enter, View, and Esc buttons, select *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.
- ❏ Select 19200 baud for the RS-232/RS-422 port in *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.
- ❏ Indicate that the RS-232/RS-422 port is set to 19200 baud in *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.

⑤ **View (▼) button —** The View (▼) button has two primary functions (•) and eight secondary (❏) functions:

- Select *View-Only* mode that displays the current configuration.

NOTE *View-only mode also provides a way to mute and unmute the outputs. See* Muting and unmuting video and/or audio outputs *on page 3-26.*

- Indicate that *View-Only* mode is active.
- ❏ In the *I/O Group* mode, select group 3. See *I/O grouping* on page 3-17.
- ❏ In the *I/O Group* mode, indicate that group 3 is selected. See *I/O grouping* on page 3-17.
- ❏ Decrease the RGB delay of switches to the selected output. See *Setting RGB delay* on page 3-21.
- ❏ Decrease the audio level of the selected input. See *Viewing and adjusting the input audio level* on page 3-29.
- ❏ Decrease the volume of the selected output. See *Viewing and adjusting the output volume* on page 3-33.
- ❏ With the Enter, Preset, and Esc buttons, select *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.
- ❏ Select 38400 baud for the RS-232/RS-422 port in *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.
- ❏ Indicate that the RS-232/RS-422 port is set to 38400 baud in *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.

⑥ **Esc (▲) button —** The Esc (▲) button has two primary functions (•) and eight secondary (❑) functions:

- Cancel operations or selections in progress and reset the front panel button indicators.

NOTE *The Esc (▲) button does **not** reset the current configuration, the RGBHV button and Audio selection button, any presets, or any audio gain or attenuation or volume settings.*

- Flashes once to indicate that the escape function has been activated.

❑ In the *I/O Group* mode, select group 4. See *I/O grouping* on page 3-17.

❑ In the *I/O Group* mode, indicate that group 4 is selected. See *I/O grouping* on page 3-17.

❑ Increase the RGB delay of switches to the selected output. See *Setting RGB delay* on page 3-21.

❑ Increase the audio level of the selected input. See *Viewing and adjusting the input audio level* on page 3-29.

❑ Increase the volume of the selected output. See *Viewing and adjusting the output volume* on page 3-33.

❑ With the Enter, Preset, and View buttons, select *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.

❑ Select 115200 baud for the RS-232/RS-422 port in *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.

❑ Indicate that the RS-232/RS-422 port is set to 115200 baud in *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.

I/O controls

You must specify video, audio, or both when you are creating or viewing a configuration. This is done with the RGBHV button (⑦) and Audio (⑧) buttons.

⑦ **RGBHV button —** The RGBHV button has two primary functions (•) and five secondary (❑) functions:

- Selects and deselects video for a configuration that is being created or viewed.
- Lights green to indicate that video is available for configuring or for viewing.

❑ With the Audio button, toggles the front panel lock on or off. See *Locking out the front panel (*Executive *mode)* on page 3-38.

❑ With the Audio button, commands the front panel system reset. See *Performing a system reset from the front panel* on page 3-38.

❑ Selects the *RGB delay* mode, in which you can set the RGB delay. See *Setting RGB delay* on page 3-21.

❑ Select the RS-232 protocol for the RS-232/RS-422 port in *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.

❑ Indicate that the RS-232/RS-422 port is set to the RS-232 protocol in *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.

⑧ **Audio button —** The Audio button has two primary functions (•) and three secondary (❑) functions

- Selects and deselects audio for a configuration that is being created or viewed.
- Lights to indicate that audio is available for configuration or viewing.

❑ Selects the *Audio* mode, in which you can adjust the input audio level and the output audio volume. See *Viewing and adjusting the input audio level* on page 3-29 and *Viewing and adjusting the output volume* on page 3-33.

❑ With the RGBHV button, toggles the front panel lock on or off. See *Locking out the front panel* (Executive *mode)* on page 3-38.

❑ With the RGBHV button, commands the front panel system reset. See *Performing a system reset from the front panel* on page 3-38.

❑ Select the RS-422 protocol for the RS-232/RS-422 port in *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.

❑ Indicate that the RS-232/RS-422 port is set to the RS-422 protocol in *Serial Port Configuration* mode. See *Selecting the RS-232/RS-422 protocol and baud rate* on page 3-40.

Button icons

The numbered translucent covers on the input and output pushbuttons can be removed and replaced to insert labels behind the covers.

Input and output labels can be created easily with Extron's Button-Label Generator software, which ships with every Extron matrix switcher. Each input and output can be labeled with names, alphanumeric characters, or even color bitmaps for easy and intuitive input and output selection (figure 3-2). See chapter 5, *Matrix Software*, for details on using the labeling software. See Appendix B, *Specifications, Part Numbers, and Accessories*, for blank labels and a procedure for removing and replacing the translucent covers.

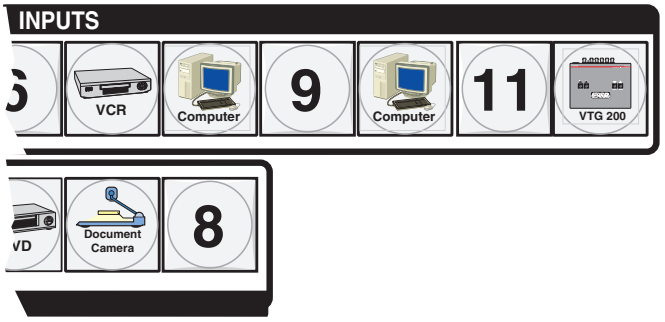


Figure 3-2 — Sample button icons

Front Panel Operations

The following paragraphs detail the power-up process and then provide sample procedures for creating ties, changing a configuration, viewing configurations, saving and recalling a preset, muting and unmuting outputs, viewing and adjusting the audio level, viewing and adjusting the output volume, locking out the front panel, performing one of several resets, toggling background illumination on and off, and reading and setting the RS-232/RS-422 Remote port settings.

Power

Apply power by connecting the power cord to an AC source. The switcher performs a self-test that flashes the front panel button indicators green, red, and amber and then turns them off. An error-free power up self-test sequence leaves all I/O and control buttons either unlit or showing background illumination. The lit/unlit status RGBHV or Video button and the Audio button is the same as when the switcher was powered off.

The current configuration and all presets are saved in non-volatile memory. When power is applied, the most recent configuration is retrieved. The previous presets remain intact.

If an error occurs during the self-test, the switcher locks up and does not operate. If your switcher locks up on power-up, call the Extron S^3 Sales & Technical Support Hotline.

Creating a configuration

The current configuration can be changed using the front panel buttons. Change the current configuration as follows:

1. Press the Esc button to clear any input button indicators, output button indicators, or control button indicators that may be lit.
2. Select to configure video, audio, or both by pressing the RGBHV button and/or Audio button.
3. Select the desired input and output(s) by pressing the input and output buttons.
   - Input buttons and output buttons light or blink **amber** to indicate video and audio ties, **green** to indicate video only ties, and **red** to indicate audio only ties.
   - To indicate **potential ties**, output buttons **blink** the appropriate color when an input is selected.
   - To indicate **current ties**, output buttons **light steadily** the appropriate color when an input is selected.
   - To clear unwanted outputs, press and release the associated lit output buttons. To indicate **potential unties**, output buttons **blink** the appropriate color when an output is deselected but not untied from the input.
4. Press and release the Enter button to accept the tie.
5. Repeat steps **1** through **4** to create additional ties until the desired configuration is complete.

NOTE

- *Only one video input and one audio input can be tied to an output.*
- *If a tie is made between an input and an output, and the selected output was previously tied to another input, the older tie is broken in favor of the newer tie.*
- *If an input with no tie is selected, only that input's button lights.*
- *When the RGBHV button and Audio button are lit, if an input with an audio tie but no video tie is selected, the input's button and the output's button light the appropriate color (amber, green, or red).*
- *As each input and output is selected, the associated output button blinks the appropriate color to indicate a tentative tie. Buttons for output(s) that were already tied to the input light the appropriate color steadily. Outputs that are already tied can be left on, along with new blinking selections, or toggled off by pressing the associated output button.*
- *If you press the input button for an I/O grouped input and then try to select an output in a different group, you cannot select the associated output button. The associated input button remains lit.*

Example 1: Creating a set of video and audio ties

In the following example, input 5 is tied to outputs 3, 4, and 8. The steps show the front panel indications that result from your action.

NOTE *This example assumes that there are no ties in the current configuration.*

1. Press and release the Esc button (figure 3-3).

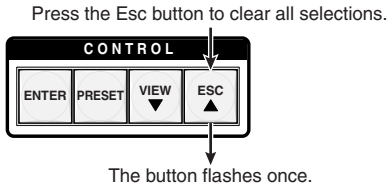


Figure 3-3 — Clear all selections

2. To select video and audio for the tie, if necessary, press and release the RGBHV button and the Audio button until the buttons light (figure 3-4).

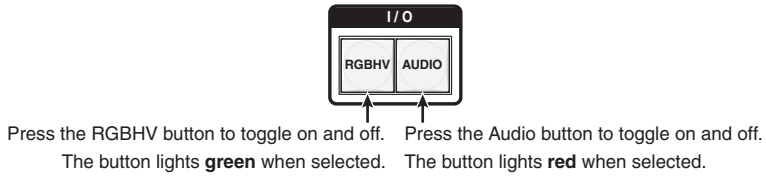

I/O
RGBHV
AUDIO
Press the RGBHV button to toggle on and off.
The button lights green when selected.
Press the Audio button to toggle on and off.
The button lights red when selected.

Figure 3-4 — Select RGBHV and audio

3. Press and release the input 5 button (figure 3-5).

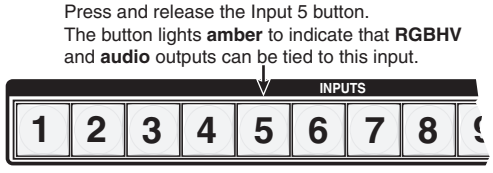


Figure 3-5 — Select an input

4. Press and release the output 3, output 4, and output 8 buttons (figure 3-6).

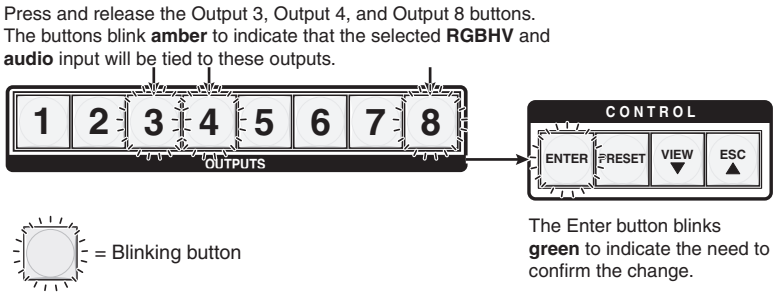

Press and release the Output 3, Output 4, and Output 8 buttons.
The buttons blink **amber** to indicate that the selected **RGBHV** and **audio** input will be tied to these outputs.
1 2 3 4 5 6 7 8
OUTPUTS
CONTROL
ENTER
PRESET
VIEW
ESC
= Blinking button
The Enter button blinks **green** to indicate the need to confirm the change.

Figure 3-6 — Select the outputs

NOTE *You can cancel the entire set of ties at this point by pressing and releasing the Esc button. The Esc button flashes red once.*

5. Press and release the Enter button (figure 3-7).

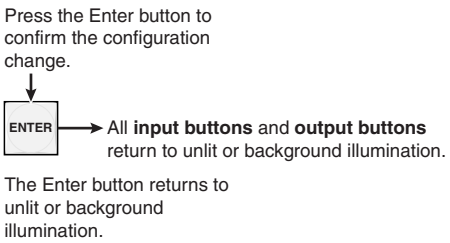

Press the Enter button to confirm the configuration change.
ENTER
All **input buttons** and **output buttons** return to unlit or background illumination.
The Enter button returns to unlit or background illumination.

Figure 3-7 — Press the Enter button

The current configuration (figure 3-8) is now:

- Input 5 video and audio tied to output 3, output 4, and output 8

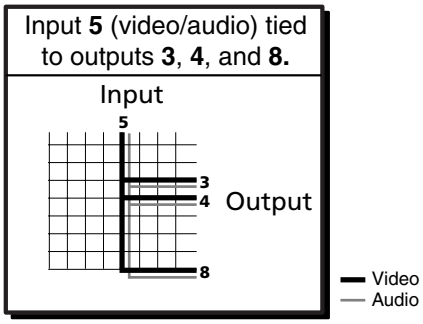


Figure 3-8 — Example 1, final configuration

Example 2: Adding a tie to a set of video and audio ties

In the following example, a new video tie is added to the current configuration. The steps show the front panel indications that result from your action.

NOTE *This example assumes that you have performed example 1.*

1. Press and release the Esc button (figure 3-9).

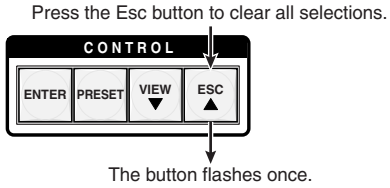


Figure 3-9 — Clear all selections

2. To select video only for the tie, if necessary, press and release the RGBHV button and the Audio button (figure 3-10).

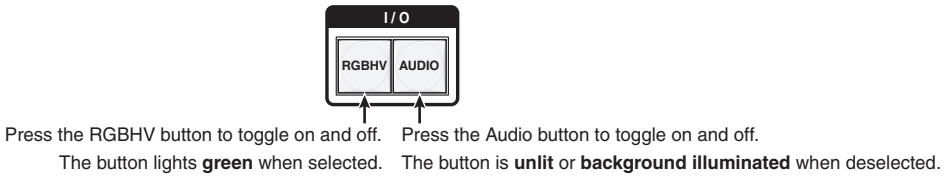

I/O
RGBHV
AUDIO
Press the RGBHV button to toggle on and off.
The button lights **green** when selected.
Press the Audio button to toggle on and off.
The button is **unlit** or **background illuminated** when deselected.

Figure 3-10 — Select RGBHV only

3. Press and release the input 5 button (figure 3-11).

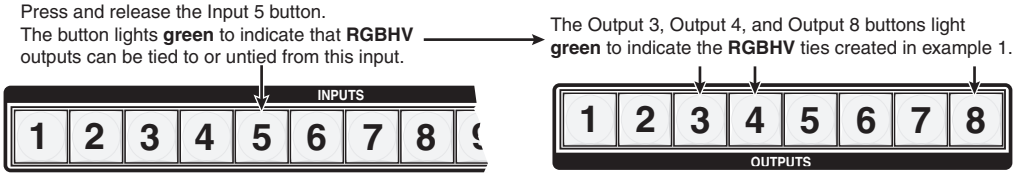

Press and release the Input 5 button.
The button lights **green** to indicate that **RGBHV** outputs can be tied to or untied from this input.
INPUTS
1 2 3 4 5 6 7 8
The Output 3, Output 4, and Output 8 buttons light **green** to indicate the **RGBHV** ties created in example 1.
1 2 3 4 5 6 7 8
OUTPUTS

Figure 3-11 — Select an input

4. Press and release the output 1 button (figure 3-12).

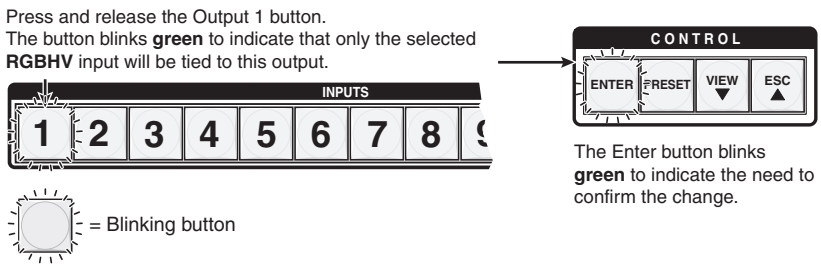

Press and release the Output 1 button.
The button blinks **green** to indicate that only the selected **RGBHV** input will be tied to this output.
INPUTS
1 2 3 4 5 6 7 8
= Blinking button
CONTROL
ENTER
PRESET
VIEW
ESC
The Enter button blinks **green** to indicate the need to confirm the change.

Figure 3-12 — Select the output

5. Press and release the Enter button (figure 3-13).

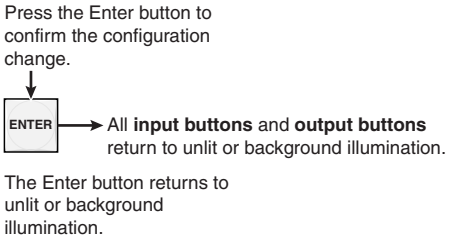

Press the Enter button to confirm the configuration change.
ENTER
All **input buttons** and **output buttons** return to unlit or background illumination.
The Enter button returns to unlit or background illumination.

Figure 3-13 — Press the Enter button

The current configuration (figure 3-14) is now:

- Input 5 video tied to output 1, output 3, output 4, and output 8
- Input 5 audio tied to output 3, output 4, and output 8

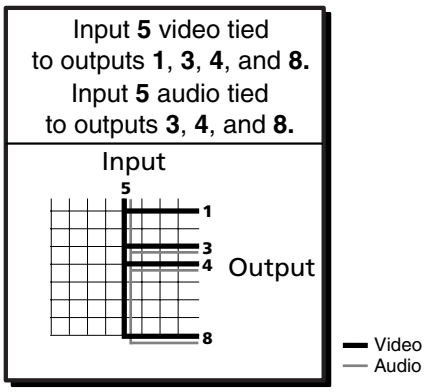


Figure 3-14 — Example 2, final configuration

Example 3: Removing a tie from a set of video and audio ties

In the following example, an existing audio tie is removed from the current configuration. The steps show the front panel indications that result from your action.

NOTE *This example assumes that you have performed example 1 and example 2.*

1. Press and release the Esc button (figure 3-15).

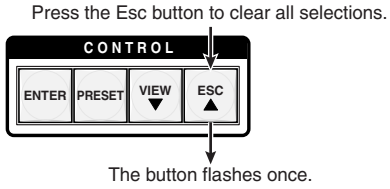


Figure 3-15 — Clear all selections

2. To select audio only for the tie, if necessary, press and release the RGBHV button and the Audio button (figure 3-16).

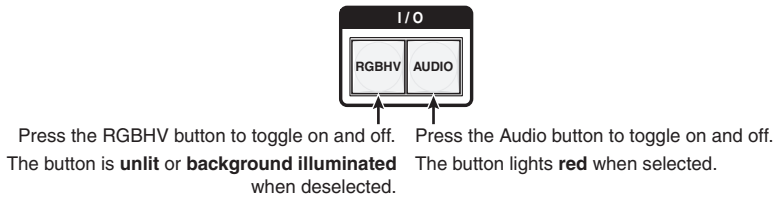

I/O
RGBHV
AUDIO
Press the RGBHV button to toggle on and off.
The button is **unlit** or **background illuminated** when deselected.
Press the Audio button to toggle on and off.
The button lights **red** when selected.

Figure 3-16 — Select audio only

3. Press and release the input 5 button (figure 3-17).

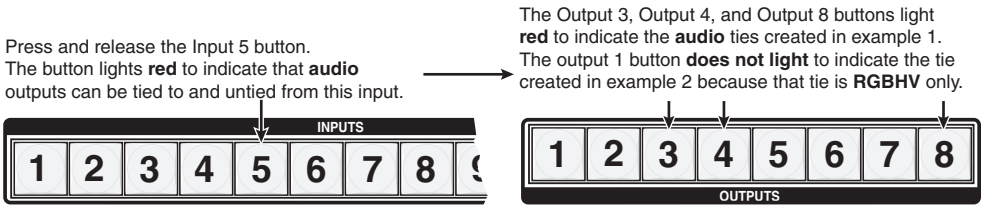

Press and release the Input 5 button.
The button lights **red** to indicate that **audio** outputs can be tied to and untied from this input.
The Output 3, Output 4, and Output 8 buttons light **red** to indicate the **audio** ties created in example 1.
The output 1 button **does not light** to indicate the tie created in example 2 because that tie is **RGBHV** only.
INPUTS
1 2 3 4 5 6 7 8
OUTPUTS
1 2 3 4 5 6 7 8

Figure 3-17 — Select an input

4. Press and release the output 4 button (figure 3-18).

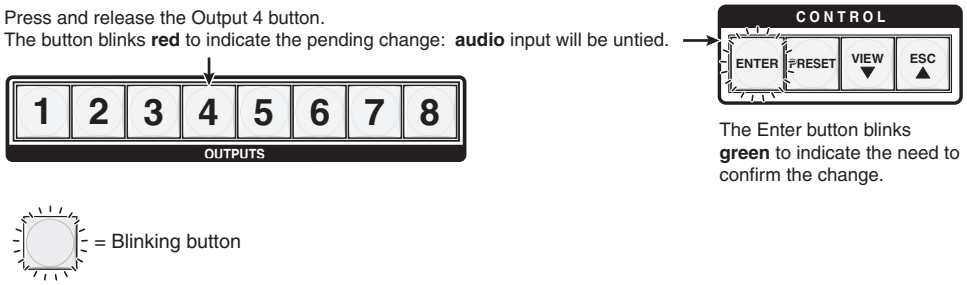

Press and release the Output 4 button.
The button blinks **red** to indicate the pending change: **audio** input will be untied.
CONTROL
ENTER
PRESET
VIEW
ESC
The Enter button blinks **green** to indicate the need to confirm the change.
1 2 3 4 5 6 7 8
OUTPUTS
= Blinking button

Figure 3-18 — Deselect the output

5. Press and release the Enter button (figure 3-19).

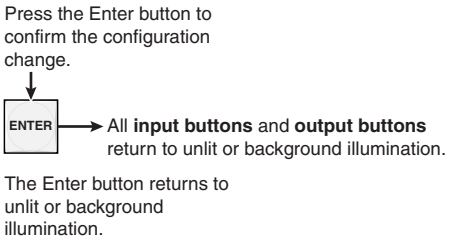

Press the Enter button to confirm the configuration change.
ENTER
All input buttons and output buttons return to unlit or background illumination.
The Enter button returns to unlit or background illumination.

Figure 3-19 — Press the Enter button

The current configuration (figure 3-20) is now:

- **Video** —

  (Video only models) — Input 5 tied to output 1, output 3, and output 8

  (Video and audio models) — Input 5 video tied to output 1, output 3, output 4, and output 8

- **Audio** — Input 5 audio tied to output 3 and output 8

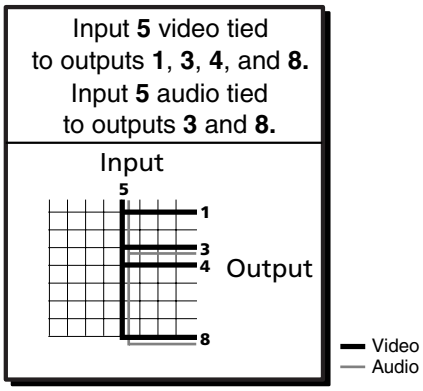


Figure 3-20 — Example 3, final configuration, audio switcher

Viewing a configuration

The current configuration can be viewed using the front panel buttons. The *View-Only* mode prevents inadvertent changes to the current configuration. *View-Only* mode also provides a way to mute video and audio outputs (see *Muting and unmuting video and/or audio outputs* on page 3-26.

View the current configuration as follows:

1. Press the Esc button to clear any input button indications, output button indications, or control button indications that may be on.
2. Press and release the View button. All of the buttons for outputs that are **not** tied light as follows:
   - **Amber**: No tied video **or** audio input
   - **Green**: No tied video input
   - **Red**: No tied audio input
3. Select video, audio, or both to view by pressing the RGBHV button and/or the Audio button.
4. Select the desired input or output(s) whose ties you wish to view by pressing the input and output buttons.

NOTE

- *When you enter* View-Only *mode, the output buttons light for all outputs without ties. Likewise, when you push an output button for which there are no ties, the output buttons light for all outputs without ties.*
- *To see all ties of the current configuration, press and release each input and output button, one at a time, with the RGBHV button and the Audio button lit.*
- *In* View-Only *mode, you can view video and audio, video-only, or audio-only ties. Pressing and releasing the RGBHV button and the Audio button toggles each selection on and off.*
- *When you view video and audio ties, the RGBHV button is lit green and the Audio button is lit red. After you select an input or output, the output buttons light different colors to show where video and audio ties are not the same (audio is broken away). Amber = video and audio, green = video only, and red = audio only.*

Example 4: Viewing video and audio, audio only, and video only ties

The following steps show an example of viewing the video and audio, audio-only, and video-only ties in the current configuration. The steps show the front panel indications that result from your action.

NOTE *This example assumes that you have performed example 1, example 2, and example 3.*

1. Press and release the Esc button (figure 3-21).

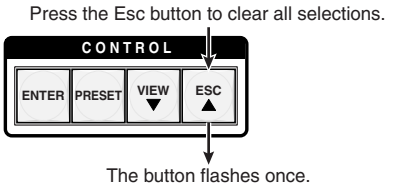


Figure 3-21 — Clear all selections

2. Press and release the View button to enter *View-Only* mode. The View button lights red.

3. To select both video and audio for viewing, if necessary, press and release the RGBHV button and the Audio button (figure 3-22).

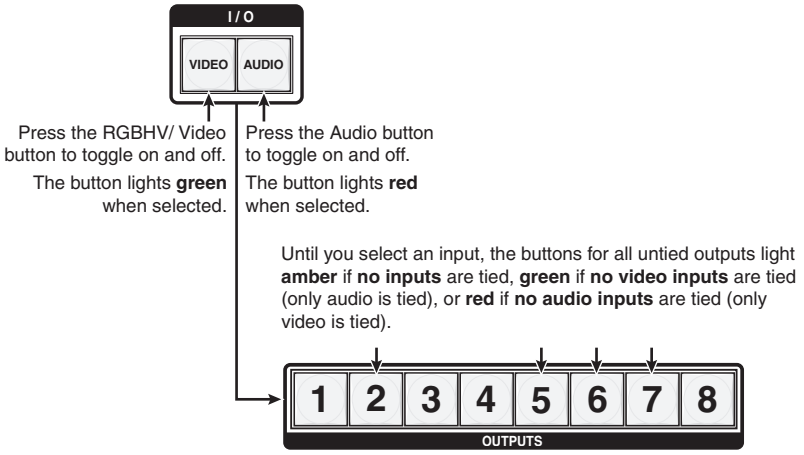

I/O
VIDEO
AUDIO
Press the RGBHV/ Video button to toggle on and off.
The button lights green when selected.
Press the Audio button to toggle on and off.
The button lights red when selected.
Until you select an input, the buttons for all untied outputs light amber if no inputs are tied, green if no video inputs are tied (only audio is tied), or red if no audio inputs are tied (only video is tied).
1 2 3 4 5 6 7 8
OUTPUTS

Figure 3-22 — Select RGBHV and audio

4. Press and release the input 5 button (figure 3-23).

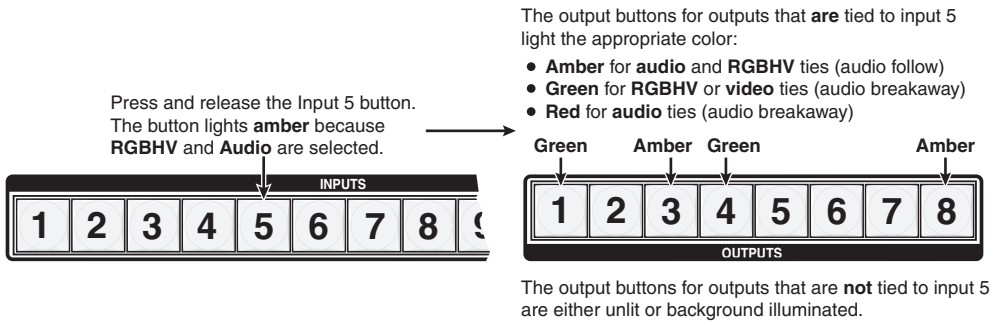

The output buttons for outputs that are tied to input 5 light the appropriate color:
• Amber for audio and RGBHV ties (audio follow)
• Green for RGBHV or video ties (audio breakaway)
• Red for audio ties (audio breakaway)
Press and release the Input 5 button.
The button lights amber because RGBHV and Audio are selected.
INPUTS
1 2 3 4 5 6 7 8
Green Amber Green Amber
1 2 3 4 5 6 7 8
OUTPUTS
The output buttons for outputs that are not tied to input 5 are either unlit or background illuminated.

Figure 3-23 — Select an input

NOTE *You can also view a set of ties by selecting a tied output. To demonstrate this, note the number of a lit output button, and then press and release the output button for an untied (unlit or background illumination) output. Observe that all of the untied outputs light. Then press the output button that you noted previously and observe that the selected output button, the tied input button (input 5), and the output buttons light for all of the outputs that are tied to the input.*

5. Press and release the RGBHV button to deselect RGBHV (figure 3-24).

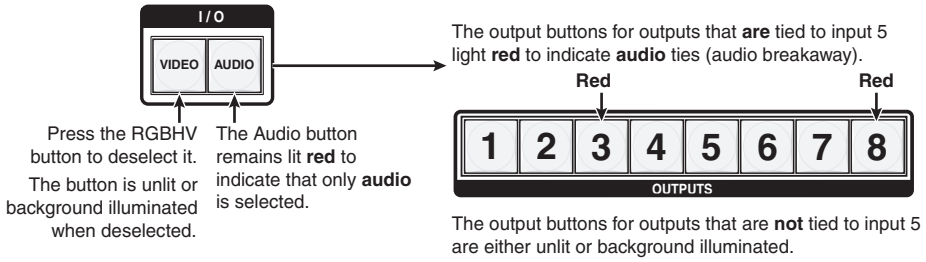

I / O
VIDEO
AUDIO
Press the RGBHV button to deselect it.
The button is unlit or background illuminated when deselected.
The Audio button remains lit **red** to indicate that only **audio** is selected.
The output buttons for outputs that **are** tied to input 5 light **red** to indicate **audio** ties (audio breakaway).
Red
Red
1 2 3 4 5 6 7 8
OUTPUTS
The output buttons for outputs that are **not** tied to input 5 are either unlit or background illuminated.

Figure 3-24 — Deselect RGBHV to view audio ties only

6. Press and release the RGBHV button and the Audio button to toggle the RGBHV button on green and the Audio button either unlit or providing background illumination (figure 3-25).

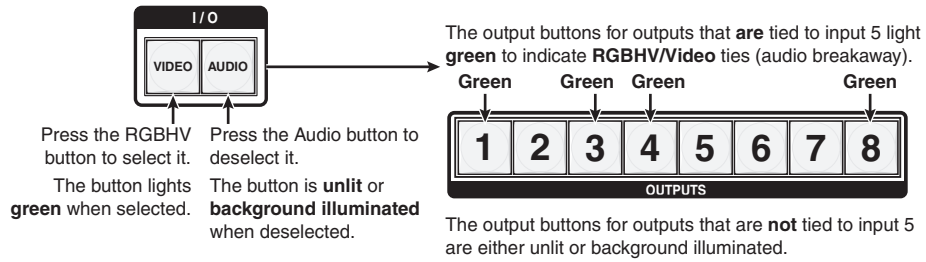

I / O
VIDEO
AUDIO
Press the RGBHV button to select it.
The button lights **green** when selected.
Press the Audio button to deselect it.
The button is **unlit** or **background illuminated** when deselected.
The output buttons for outputs that **are** tied to input 5 light **green** to indicate **RGBHV/Video** ties (audio breakaway).
Green
Green
Green
Green
1 2 3 4 5 6 7 8
OUTPUTS
The output buttons for outputs that are **not** tied to input 5 are either unlit or background illuminated.

Figure 3-25 — Deselect audio and select RGBHV to view RGBHV only

If video ties are established for input 5, the output buttons for all video outputs tied to input 5 light green. If no ties are established for input 5, all output buttons return to either unlit or to background illumination.

7. Press and release the View button to exit *View-Only* mode (figure 3-26).

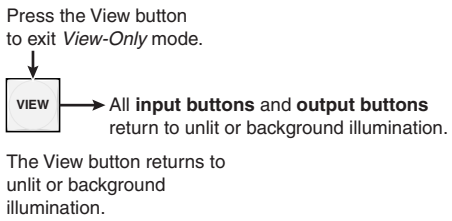

Press the View button to exit *View-Only* mode.
VIEW
All **input buttons** and **output buttons** return to unlit or background illumination.
The View button returns to unlit or background illumination.

Figure 3-26 — Press the View button to exit* View-Only *mode

I/O grouping

I/O grouping is a matrix switcher feature that allows you to subdivide the front panel control of the matrix into four smaller functional sub-switchers and limit tie creation **from the front panel only**. Inputs and outputs can be assigned to one of four groups or not assigned to any group.

When you are creating ties on the front panel, inputs and outputs that are assigned to a group can be tied only to other outputs and inputs within the same group. For example, a front panel operator cannot tie an input that is assigned to group 1 to an output that is assigned to group 2. Ungrouped inputs and outputs can be switched to outputs and inputs in any group. Ties between groups (an input in group 1 tied to an output in group 2) **can** be created under RS-232/RS-422 or Ethernet control.

Suggested applications for the I/O grouping feature include:

- Segregating specific video formats to prevent an input in one video format from being inadvertently applied to an output device that supports another video format (figure 3-27)
- Segregating input and output devices that are in separate rooms
- Isolating video from being displayed on specific output devices for operational security reasons

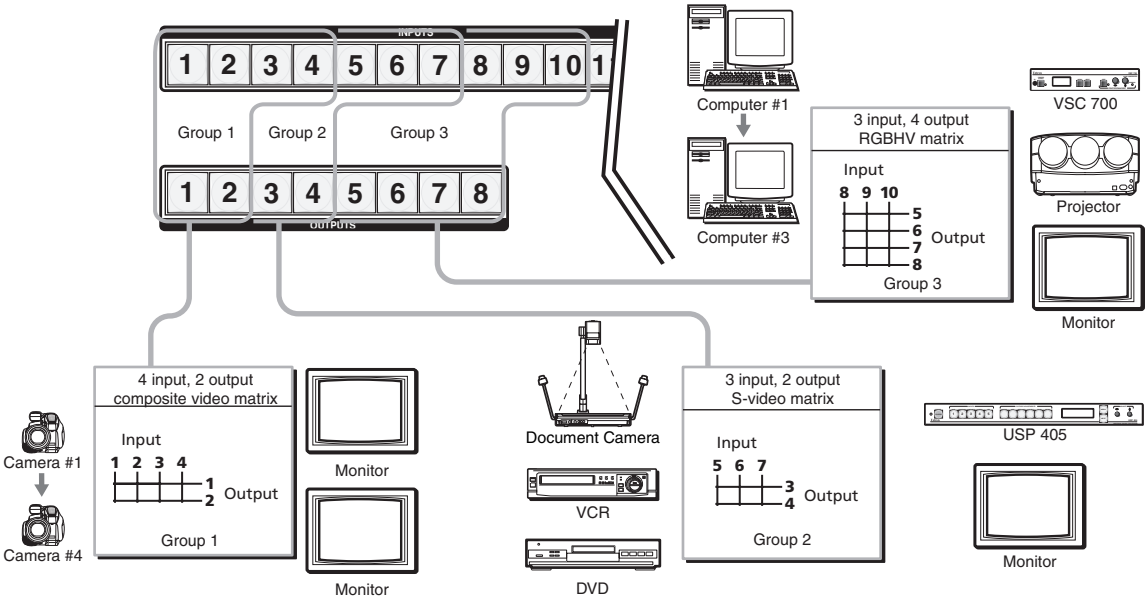


Figure 3-27 — I/O grouping of incompatible video formats

The I/O groups can be set up on the front panel or by using RS-232/RS-422 and Ethernet ports and either the SIS or the Windows control program (see chapter 4, *Programmer's Guide*, and chapter 5, *Matrix Software*). Create I/O groups on the front panel as follows:

1. Press the Esc button to clear any input buttons, output buttons, or control buttons that may be lit.
2. To enter *I/O Group* mode, press and **hold** the Input 1 and Output 1 buttons until the input and output buttons light to display the ungrouped inputs and outputs.
3. Press and release one of the Control buttons to select a group:
   - Press the Enter button to select group 1.
   - Press the Preset button to select group 2.
   - Press the View button to select group 3.
   - Press the Esc button to select group 4.
4. Select the desired input(s) and output(s) to assign to the group by pressing the input and output buttons.
5. Press and release the RGBHV and Audio button to exit the *I/O Group* mode, or allow the mode to time out after approximately 30 seconds.

NOTE

- *Ties between groups (an input in group 1 tied to an output in group 2) **can** be created under RS-232/RS-422 or Ethernet control.*
- *Presets can be created under RS-232/RS-422 or Ethernet control that tie inputs and outputs across group boundaries. These presets **are** selectable from the front panel.*
- *An input or output can be assigned to only one group. If you assign an input or output to a group and that input or output is already assigned to a different group, the older grouping is discarded in favor of the new grouping.*
- *Yoy **can** break audio away from the video for a given input or output (assigned to different groups) by isolating only video or only audio using the front panel RGBHV and/or Audio buttons after you select* I/O Group *mode (between steps **2** and **3**).*

  *Audio breakaway across different groups **can be** confusing when you are operating the front panel. Breakaway **is not displayed** by the Matrix Switchers Control Program, HTML pages, or SIS commands; and is **not** recommended.*
- *For I/O groups to have any function, at least two groups must be created.*

Example 5: Grouping inputs and outputs

In the following an example, several switcher inputs and outputs are assigned to groups. The steps show the front panel indications that result from your action.

1. Press and release the Esc button (figure 3-28).

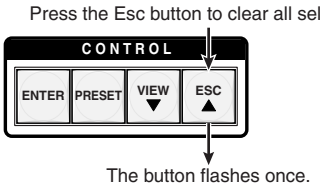


Figure 3-28 — Clear all selections

2. To enter *I/O Group* mode, press and **hold** the Input 1 and Output 1 buttons for approximately 2 seconds and then release the buttons (figure 3-29).

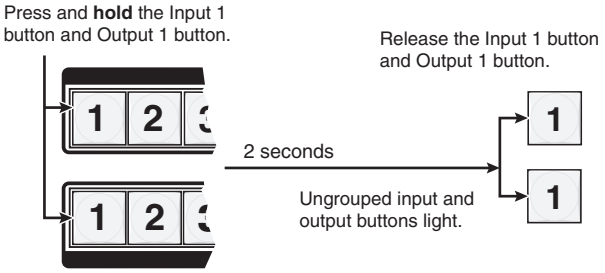

Press and **hold** the Input 1 button and Output 1 button.
Release the Input 1 button and Output 1 button.
1
2
2 seconds
Ungrouped input and output buttons light.
1
1

Figure 3-29 — Select* I/O Group *mode

3. Press and release the Enter button to select group 1 (figure 3-30).

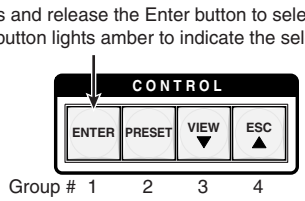


Figure 3-30 — Select an I/O group

4. Press and release the input 1 through 4 and output 1 through 4 buttons (figure 3-31).

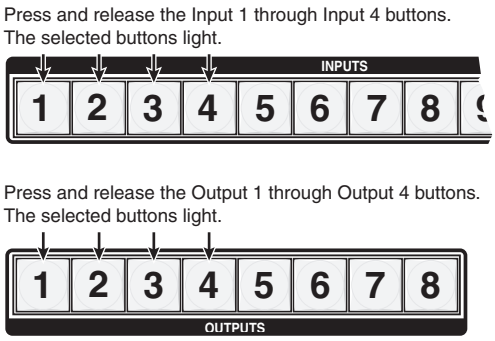

Press and release the Input 1 through Input 4 buttons.
The selected buttons light.
INPUTS
1 2 3 4 5 6 7 8
Press and release the Output 1 through Output 4 buttons.
The selected buttons light.
1 2 3 4 5 6 7 8
OUTPUTS

Figure 3-31 — Assign inputs and outputs

5. Press and release the Preset button to select group 2 (figure 3-32).

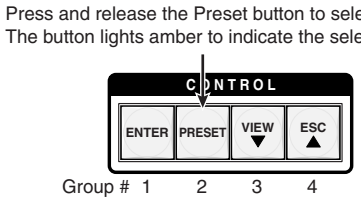


Figure 3-32 — Select an I/O group

6. Press and release the input 5 through 8 and output 5 through 8 buttons (figure 3-33).

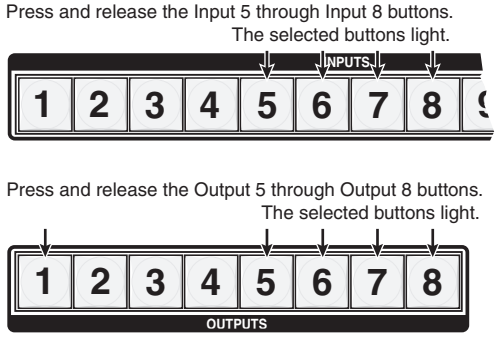

Press and release the Input 5 through Input 8 buttons.
The selected buttons light.
INPUTS
1 2 3 4 5 6 7 8
Press and release the Output 5 through Output 8 buttons.
The selected buttons light.
1 2 3 4 5 6 7 8
OUTPUTS

Figure 3-33 — Assign inputs and outputs

7. Do nothing for approximately 30 seconds. The front panel times out and the switcher exits *I/O Group* mode.
   - Group 1 consists of inputs 1 through 4 and outputs 1 through 4.
   - Group 2 consists of inputs 5 through 8 and outputs 5 through 8.

Setting RGB delay

The switcher can briefly blank the RGB (video) output while it switches to the new input's sync source, and then switches the RGB signals. This allows a brief delay for the display to adjust to the selected input's sync timing before displaying the new picture, which then appears without glitches. RGB delay, also known as Triple-Action Switching or video mute switching, is user selectable from 0 to 5 seconds, in half-second increments.

You can set the RGB delay interval on the front panel or by using RS-232/RS-422 and Ethernet ports with either the SIS, Windows control program, or HTML pages. (See chapter 4, *Programmer's Guide*; chapter 5, *Matrix Software*; and chapter 6, *HTML operation)*. Specify the RGB delay interval for a specific output on the front panel as follows:

1. Press the Esc button to clear any input buttons, output buttons, or control buttons that may be lit.
2. To enter *RGB Delay* mode, press and **hold** the RGBHV button until the button begins to blink green, then release the button.
3. Press and release an output button to select an output. Each lit input button, from Input 1 through Input 10, indicates a half second of RGB delay interval for the selected output.
4. Press and release the Esc (▲) and View (▼) buttons to increase and decrease the interval.
5. Press and release the RGBHV button to exit the *RGB Delay* mode. The RGBHV button stops blinking.

NOTE

- *Pressing the Enter or Preset button also exits* RGB Delay *mode. Pressing the Preset button changes to* Recall Preset *mode.*
- *The RGB interval for each output is stored in non-volatile memory. When power is removed and restored, the delay settings are retained.*
- *Exiting* RGB Delay *mode by pressing the RGBHV button always returns the I/O configuration to audio only selected for configuration.*

Example 6: Setting the RGB delay for an output

In the following example, the RGB delay is increased for output 1. The steps show the front panel indications that result from your action.

1. Press and release the Esc button (figure 3-34).

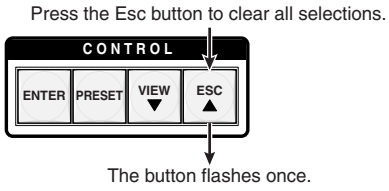


Figure 3-34 — Clear all selections

2. Press and **hold** the RGBHV button for approximately 2 seconds (figure 3-35).

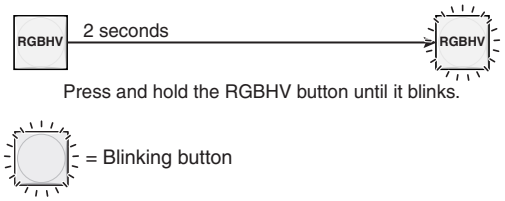


Figure 3-35 — Select* RGB Delay *mode

3. Press and release the output 17 button (figure 3-36).

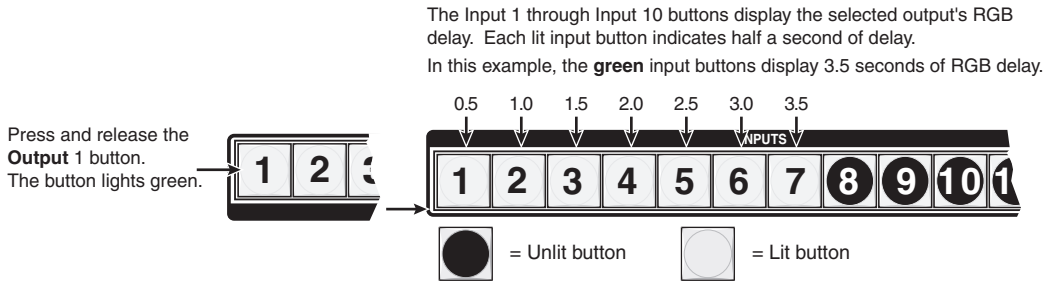

The Input 1 through Input 10 buttons display the selected output's RGB delay. Each lit input button indicates half a second of delay.
In this example, the **green** input buttons display 3.5 seconds of RGB delay.
0.5 1.0 1.5 2.0 2.5 3.0 3.5
INPUTS
1 2 3 4 5 6 7 8 9 10
Press and release the **Output** 1 button. The button lights green.
= Unlit button
= Lit button

Figure 3-36 — Select an output

4. Press and release the Esc (▲) button once (figure 3-37) to increase the RGB delay by a half second.

   Press and release the Esc (▲) button twice more to increase the RGB delay by a whole second. Note the input button indication changes that occur each time the Esc (▲) button is pressed and released.

   Figure 3-37 show the result of pressing the Esc (▲) button a total of three times.

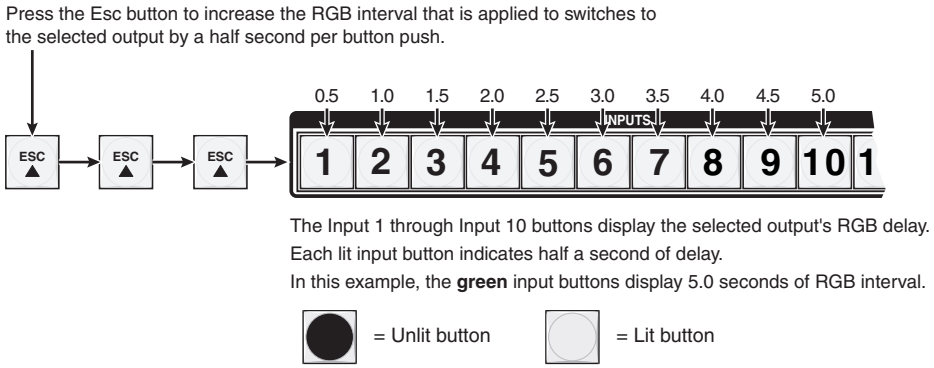

Press the Esc button to increase the RGB interval that is applied to switches to the selected output by a half second per button push.
0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0
INPUTS
ESC
ESC
ESC
1 2 3 4 5 6 7 8 9 10
The Input 1 through Input 10 buttons display the selected output's RGB delay.
Each lit input button indicates half a second of delay.
In this example, the **green** input buttons display 5.0 seconds of RGB interval.
= Unlit button
= Lit button

Figure 3-37 — Adjust the RGB delay interval

5. Press and release the RGBHV button (figure 3-38).

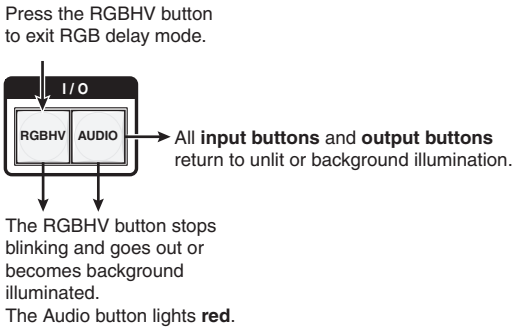


Figure 3-38 — Deselect* RGB Delay *mode

Using presets

The current configuration (configuration 0) can be saved as a preset in any one of 32 preset memory addresses. Preset locations are assigned to the input buttons and (where necessary) output buttons. Up to 20 presets can be selected from the front panel to be either saved or retrieved. When a **preset** is retrieved from memory, it becomes the **current configuration**.

NOTE

- *Only the audio and video ties are stored and recalled; audio gain settings are not saved, and they do not change when a preset is recalled.*
- *Presets **cannot** be viewed from the front panel unless recalled as the current configuration. Presets **can** be viewed using Extron's Windows-based control program. See Chapter 5,* Matrix Software*, for more details.*
- *The current configuration and all presets are stored in non-volatile memory. When power is removed and restored, the current configuration is still active and all presets are retained.*
- *When a preset is recalled, it replaces the current configuration, which is lost unless it is also stored as a preset. The recalled preset overwrites all of the current configuration ties in favor of the preset configuration ties.*
- *Preset numbers that are too high to be available from the front panel are still accessible under RS-232/RS-422 or Ethernet control.*
- *Figure 3-39 shows the presets associated with the various input and output buttons.*

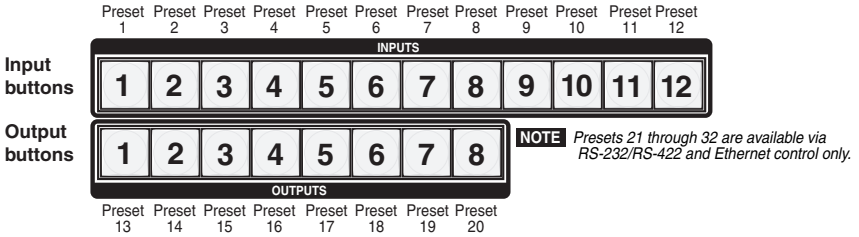


Figure 3-39 — Preset locations

Example 7: Saving a preset

In the following example, the current configuration is saved as a preset. The steps show the front panel indications that result from your action.

1. Press and release the Esc button (figure 3-40).

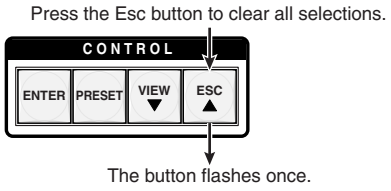


Figure 3-40 — Clear all selections

2. Press and **hold** the Preset button for approximately 2 seconds until it blinks (figure 3-41).

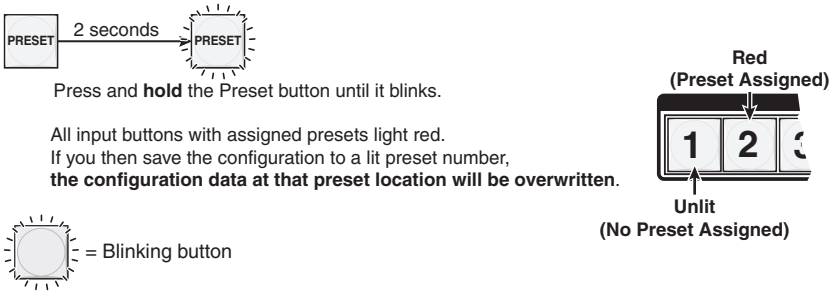


Figure 3-41 — Enter* Save Preset *mode

3. Press and release the input or output button for the desired preset (figure 3-42).

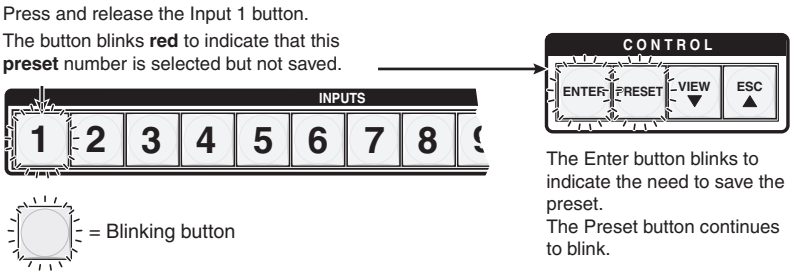


Figure 3-42 — Select the preset

4. Press and release the Enter button (figure 3-43). The current configuration is now stored in the selected memory location.

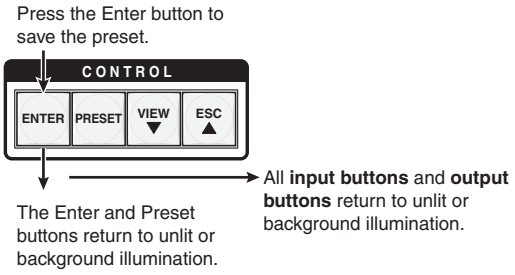

Press the Enter button to save the preset.
CONTROL
ENTER
PRESET
VIEW
ESC
All input buttons and output buttons return to unlit or background illumination.
The Enter and Preset buttons return to unlit or background illumination.

Figure 3-43 — Press the Enter button

Example 8: Recalling a preset

In the following example, a preset is recalled to become the current configuration. The steps show the front panel indications that result from your action.

1. Press and release the Esc button (figure 3-44).

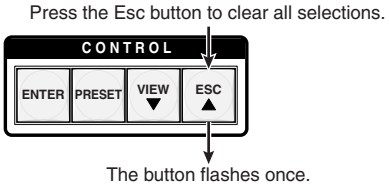


Figure 3-44 — Clear all selections

2. Press and release the Preset button (figure 3-45).

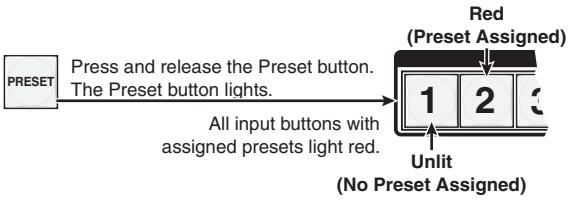


Figure 3-45 — Enter* Recall Preset *mode

3. Press and release the input or output button for the desired preset (figure 3-46).

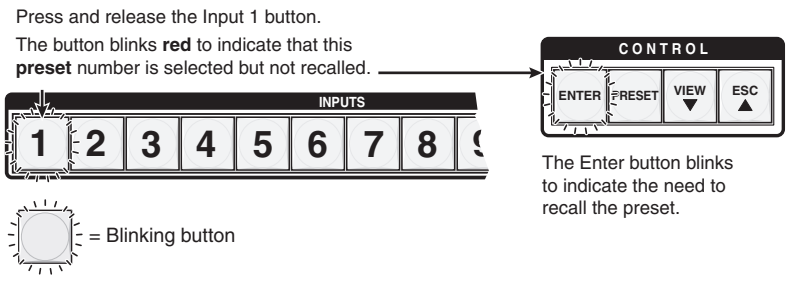


Figure 3-46 — Select the preset

4. Press and release the Enter button (figure 3-47). The configuration stored in the selected memory location is now the current configuration and can be viewed in the *View-Only* mode (see example 4).

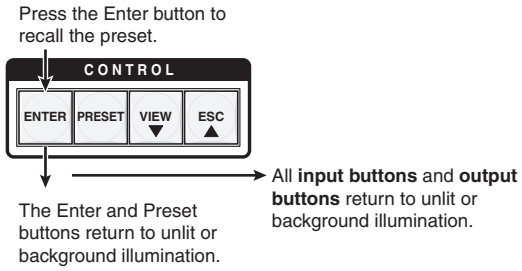

Press the Enter button to recall the preset.
CONTROL
ENTER
PRESET
VIEW
ESC
All **input buttons** and **output buttons** return to unlit or background illumination.
The Enter and Preset buttons return to unlit or background illumination.

Figure 3-47 — Press the Enter button

Muting and unmuting video and/or audio outputs

Individual outputs can be muted or unmuted as follows:

1. Press the Esc button to clear any input button indications, output button indications, or control button indications that may be on.
2. Press and release the View button.
3. Select video, audio, or both to mute or unmute by pressing the RGBHV button and/or the Audio button.
4. One at a time, press and **hold** the button(s) for the desired output(s) for approximately 2 seconds. The output LED(s) for the selected output(s) blink to indicate the mute or return to their previous state to indicate the unmute.
5. Press and release the View button to return to normal switcher operation.

NOTE

- *You can mute video and audio, video-only, or audio-only outputs. Pressing and releasing the RGBHV button and the Audio button toggles each selection on and off.*
- *When you enter* View-Only *mode, the output LEDs turn* ***on*** *for all outputs* ***without*** *ties.*
- *The video mute function mutes the R, G, and B planes only; the H and V planes are still active.*
- *Mutes are saved to non-volatile memory. When power is removed and restored, the mute settings are retained.*

Example 9: Muting and unmuting an output

In the following example, several switcher outputs are muted and unmuted. The steps show the front panel indications that result from your action.

1. Press and release the Esc button (figure 3-48).

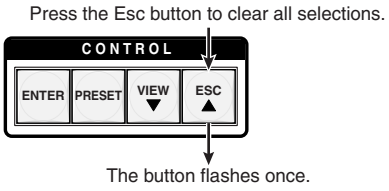


Figure 3-48 — Clear all selections

2. Press and release the View button to enter *View-Only* mode. The View button lights red.

3. To select both video and audio for viewing and muting, if necessary, press and release the RGBHV button and the Audio button (figure 3-49).

NOTE *This example shows the front panel indications if example 1, example 2, and example 3 have been completed.*

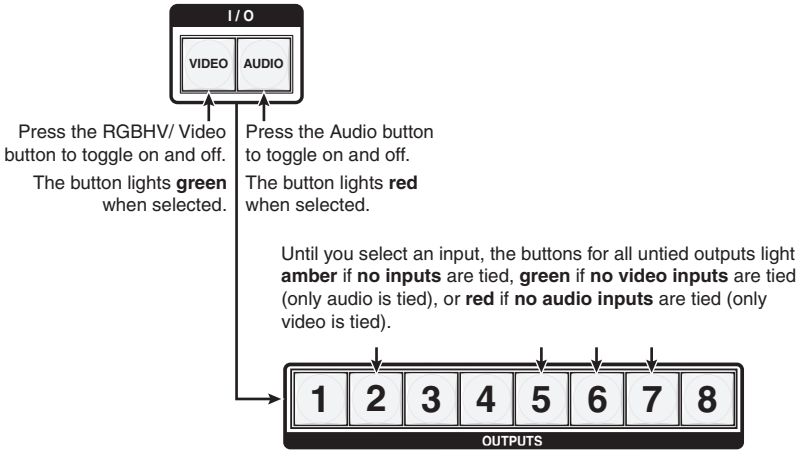

I / O
VIDEO
AUDIO
Press the RGBHV/ Video button to toggle on and off.
The button lights green when selected.
Press the Audio button to toggle on and off.
The button lights red when selected.
Until you select an input, the buttons for all untied outputs light amber if no inputs are tied, green if no video inputs are tied (only audio is tied), or red if no audio inputs are tied (only video is tied).
1
2
3
4
5
6
7
8
OUTPUTS

Figure 3-49 — Select RGBHV and audio

4. **One at a time**, press and **hold** the Output 3 button and then the Output 4 button (figure 3-50) for approximately 2 seconds until each button begins to blink. The output 3 and output 4 video and audio signals are muted.

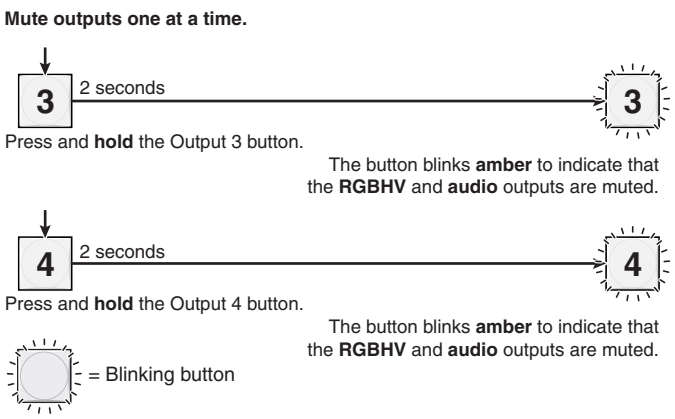

Mute outputs one at a time.
3
2 seconds
3
Press and hold the Output 3 button.
The button blinks amber to indicate that the RGBHV and audio outputs are muted.
4
2 seconds
4
Press and hold the Output 4 button.
The button blinks amber to indicate that the RGBHV and audio outputs are muted.
= Blinking button

Figure 3-50 — Mute the outputs

NOTE *If both RGBHV and audio are selected, the mute action toggles both the video and audio outputs. If either the video output or the audio output is already muted, the unmuted output is muted and the muted output is unmuted.*

NOTE *If both RGBHV and audio are selected and only video is muted, the output button flashes between green and amber. If only audio is selected, the output button flashes between red and amber.*

5. **One at a time**, press and **hold** the Output 3 button and then the Output 4 buttons (figure 3-51) for approximately 2 seconds until each button lights steadily. The output 3 and output 4 video and audio signals are unmuted.

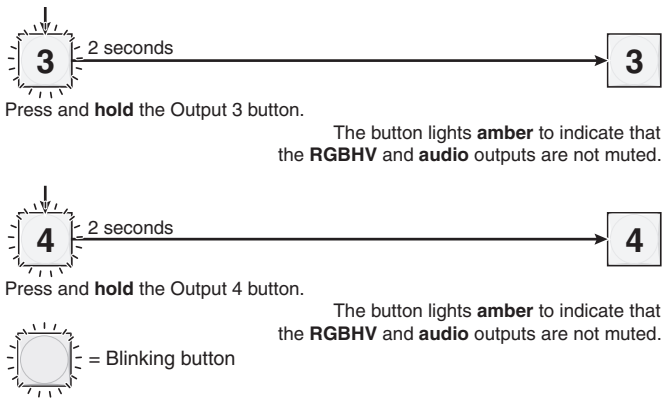

Mute outputs one at a time.
3
2 seconds
3
Press and hold the Output 3 button.
The button lights amber to indicate that the RGBHV and audio outputs are not muted.
4
2 seconds
4
Press and hold the Output 4 button.
The button lights amber to indicate that the RGBHV and audio outputs are not muted.
= Blinking button

Figure 3-51 — Unmute the outputs

NOTE *If both RGBHV and audio are selected, the unmute action toggles both the video and audio outputs. If either the video output or the audio output is already unmuted, the muted output is unmuted and the unmuted output is muted.*

6. Press and release the View button to exit *View-Only* mode (figure 3-52).

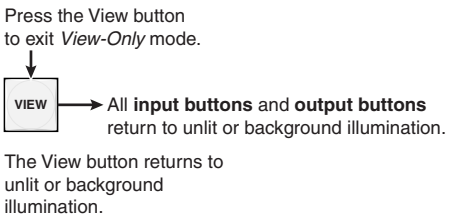


Figure 3-52 — Press the View button to exit* View-Only *mode

Viewing and adjusting the input audio level

On models with audio, the audio level of each input can be displayed and adjusted through a range of -18 dB to +24 dB to ensure that there is no noticeable volume difference among sources (figure 3-53). The audio level can be adjusted from the front panel or under RS-232/RS-422 or Ethernet control.

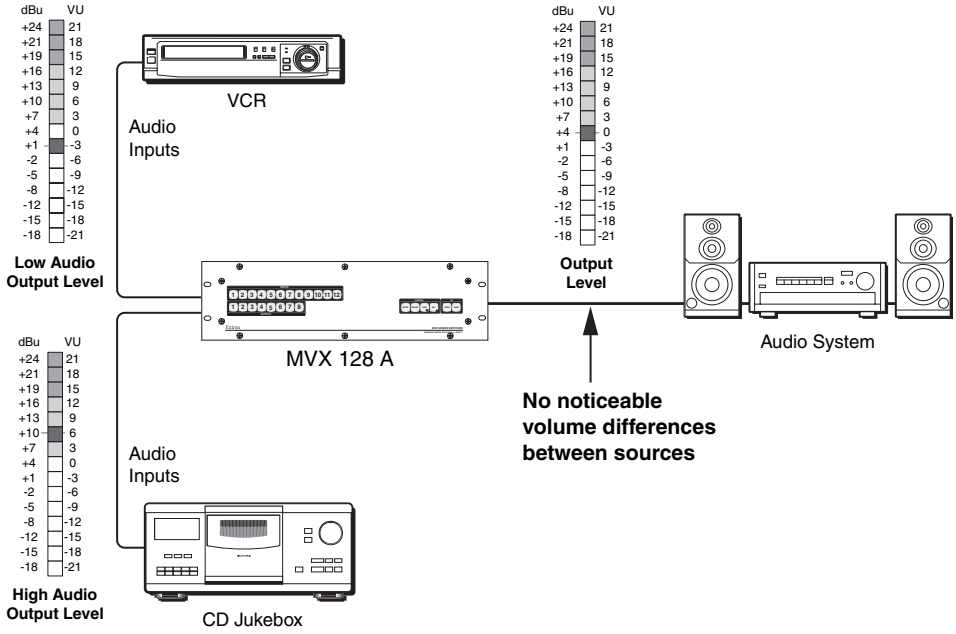


Figure 3-53 — Audio gain and attenuation

1. Press the Esc button to clear any input buttons, output buttons, or control buttons that may be lit.
2. To enter *Audio* mode, press and **hold** the Audio button until the button begins to blink red, then release the button.
3. Press and release an input button to select an input. The output buttons display audio level and polarity (+ or –) for the selected input. Each lit output button indicates 1 dB of gain or attenuation. Green output buttons indicate a gain (+) audio level and red buttons indicate an attenuation (–) level.
4. Press and release the Esc (▲) and View (▼) buttons to increase and decrease the audio level.
5. Press and release the Audio button to exit the *Audio* mode. The Audio button stops blinking.

NOTE

- *Pressing the Enter or Preset button also exits* Audio *mode. Pressing the Preset button changes to* Recall Preset *mode.*
- *There is one audio level setting per input. The audio level setting is shared by the left and right audio inputs.*
- *The audio level settings are stored in non-volatile memory. When power is removed and restored, the audio level settings are retained.*
- *Exiting* Audio *mode by pressing the Audio button always returns the I/O configuration to RGBHV and audio selected for configuration.*

Example 10: Viewing and adjusting an input audio level

In the following example, an audio level is viewed and adjusted. The steps show the front panel indications that result from your action.

The output buttons display the audio gain and attenuation. Each button indicates 1 dB when blinking slowly, 2 dB when blinking quickly, and 3 dB when lit. See the table on page 3-31.

1. Press and release the Esc button (figure 3-54).

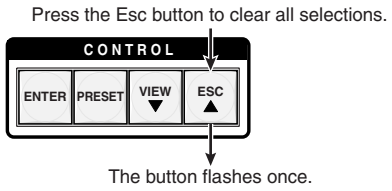


Figure 3-54 — Clear all selections

2. Press and **hold** the Audio button for approximately 2 seconds (figure 3-55).

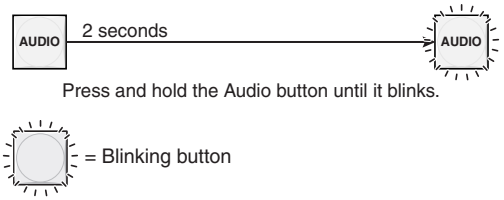
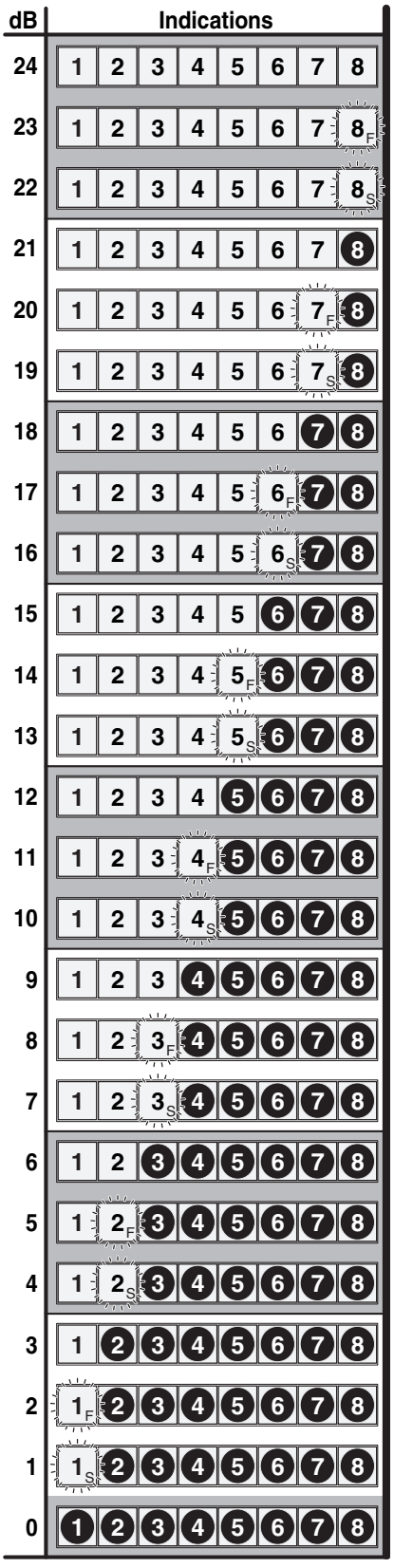


Figure 3-55 — Select* Audio *mode

Input audio level adjustment displays



3. Press and release the Input 5 button (figure 3-56).

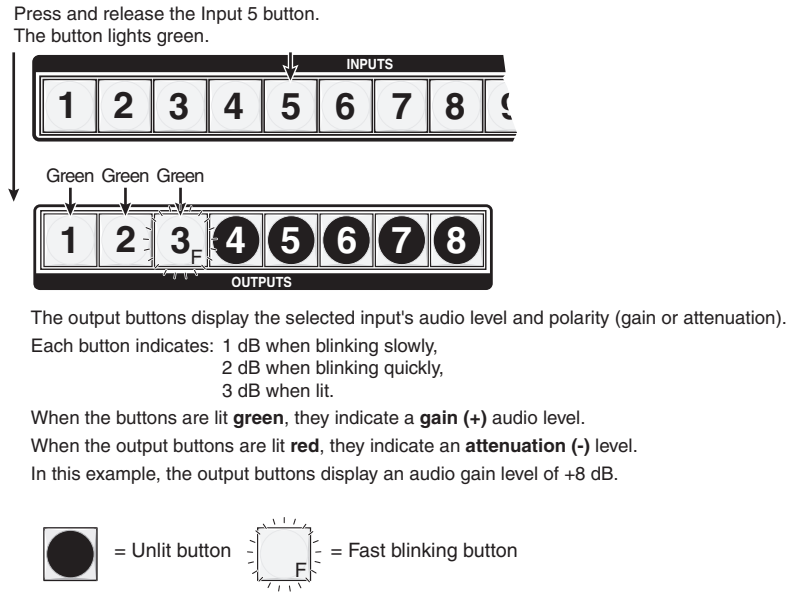

Press and release the Input 5 button.
The button lights green.
INPUTS
1 2 3 4 5 6 7 8
Green Green Green
1 2 3F 4 5 6 7 8
OUTPUTS
The output buttons display the selected input's audio level and polarity (gain or attenuation).
Each button indicates: 1 dB when blinking slowly,
2 dB when blinking quickly,
3 dB when lit.
When the buttons are lit green, they indicate a gain (+) audio level.
When the output buttons are lit red, they indicate an attenuation (-) level.
In this example, the output buttons display an audio gain level of +8 dB.
= Unlit button
F
= Fast blinking button

Figure 3-56 — Select an input

4. Press and release the View (▼) button once (figure 3-57) to decrease the input audio level by 1 dB.

   Press and release the View (▼) button several more times (figure 3-57) to decrease the input audio level by 1 dB per button push. Note the output button indication changes that occur each time the View (▼) button is pressed.

   Figure 3-57 shows the result of pressing the View (▼) button a total of nine times. Note that the level is now displayed in red to indicate a negative level.

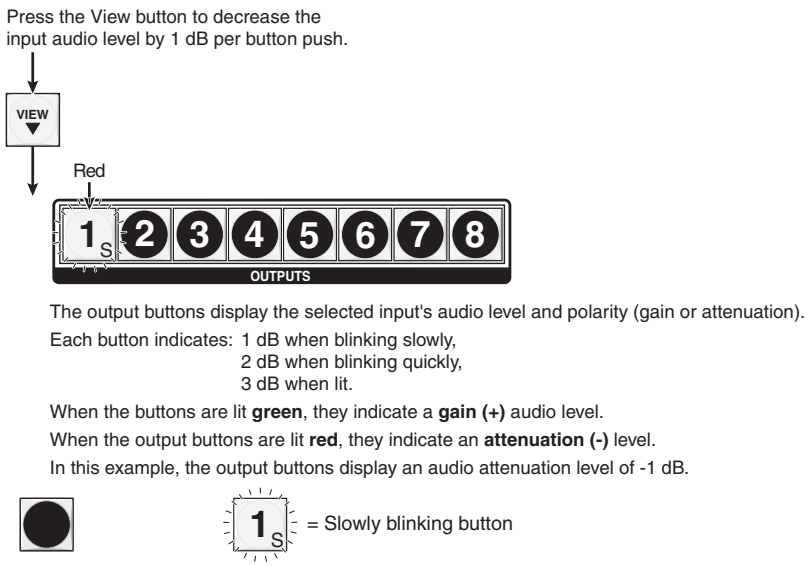

Press the View button to decrease the
input audio level by 1 dB per button push.
VIEW
Red
1S 2 3 4 5 6 7 8
OUTPUTS
The output buttons display the selected input's audio level and polarity (gain or attenuation).
Each button indicates: 1 dB when blinking slowly,
2 dB when blinking quickly,
3 dB when lit.
When the buttons are lit green, they indicate a gain (+) audio level.
When the output buttons are lit red, they indicate an attenuation (-) level.
In this example, the output buttons display an audio attenuation level of -1 dB.
1S
= Slowly blinking button

Figure 3-57 — Adjust the input audio level

5. Press and release the Audio button (figure 3-58).

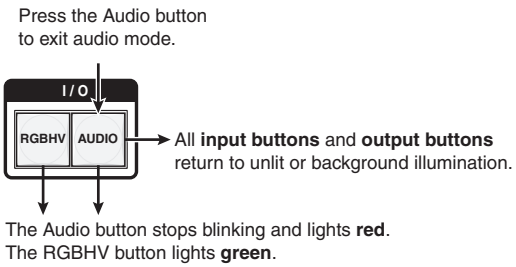

Press the Audio button
to exit audio mode.
I / O
RGBHV
AUDIO
All **input buttons** and **output buttons**
return to unlit or background illumination.
The Audio button stops blinking and lights **red**.
The RGBHV button lights **green**.

Figure 3-58 — Deselect* Audio *mode

Viewing and adjusting the output volume

On models with audio, the audio level of each output can be displayed and adjusted through a range of 100% (no attenuation) to 0% (maximum [98 dB] attenuation). The audio level can be adjusted from the front panel or under RS-232/RS-422 or Ethernet control.

1. Press the Esc button to clear any input buttons, output buttons, or control buttons that may be lit.
2. To enter *Audio* mode, press and **hold** the Audio button until the button begins to blink red, then release the button.
3. Press and release an output button to select an output. The input buttons display the volume level for the selected output. As a general rule, the more buttons that are lit, the higher the volume. The fewer buttons that are lit, the lower the volume.

   For a more detailed analysis of decoding the displayed value, see *Reading the displayed volume* on the next page.
4. Press and release the Esc (▲) and View (▼) buttons to increase and decrease the audio volume.
5. Press and release the Audio button to save the audio settings and exit the *Audio* mode. The Audio button stops blinking.

NOTE

- *There is one audio volume level setting per output. The audio level setting is shared by the left and right audio inputs.*
- *The audio volume levels are stored in non-volatile memory. When power is removed and restored, the audio level settings are retained.*
- *Exiting* Audio *mode by pressing the Audio button always returns the I/O buttons to RGBHV lit green and Audio lit red.*
- *Pressing the Enter or Preset button also exits* Audio *mode. Pressing the Preset button changes to* Recall Preset *mode.*

Reading the displayed volume

NOTE *This section is a detailed look at reading the output volume display on the switcher's front panel. If you do not need to read the exact value of the volume setting, skip this section.*

There are 65 steps of volume attenuation, with 1 dB per step (button push), except for 0-to-1, which is 35 dB. At maximum attenuation, no input buttons are lit, 98 dB of attenuation is applied, and the audio output is effectively muted. At no attenuation, all input buttons are lit and the output volume is equal to the input signal plus any gain or attenuation that is applied to that specific input using the input audio level adjustment. See *Viewing and adjusting the input audio level*, earlier in this chapter See the table on the next page to read the volume display for each display scheme.

The input buttons blink or light sequentially to indicate the approximate volume of the selected output. Volume is defined as a percentage of the input audio signal that is applied to the output. From 0% of volume, the first Esc (▲) button push applies 5.5% of the input audio signal. From 5.5% on, each Esc (▲) push applies 1.5% more of the input audio signal to the output:

- **Push Esc (▲) button —** 5.5% + 1.5% = 7% volume. The Input 1 button continues blinking slowly.
- **Push Esc (▲) button twice —** 7% + 1.5% + 1.5% = 10% volume. The Input 1 button begins to blink quickly.
- **Push Esc (▲) button nineteen times** — 10% + (19•1.5%) = 38.5% volume. Indicated by the Input 1 through 4 buttons lit steadily.

When all input buttons are lit, the audio output is 100% of the audio input level.

Another way to view the volume level is to think in terms of the attenuation that is applied to the output. Attenuation reduction is indicated by the lit or blinking input buttons: when fewer input buttons are lit, attenuation is greater (and the volume is quieter).

- At minimum volume, all input buttons are unlit or background illuminated and 98 dB of attenuation is applied to the output. The audio output is effectively muted.
- The first step of volume increase causes the Input 1 button to blink slowly. Attenuation is reduced by 35 dB (63 dB of attenuation is applied to the output). There is no change in the volume indication.
- The second step of volume increase reduces the attenuation by an additional 1 dB (62 dB of attenuation is applied to the output). The front panel display is unchanged.
- Successive steps of volume increase cause consecutive input buttons to first blink slowly, then quickly, and then light steadily.

  For example: When lit steadily, the Input 3 button indicates 47 dB of attenuation when compared to the Input 3 button blinking quickly (48 dB to 50 dB of attenuation). The blinking Input 4 button (45 dB to 46 dB of attenuation) is at least 2 dB less than the fast blinking Input 3 button (48 dB – 46 dB) and at most 5 dB less (50 dB – 45 dB).

See the table on page 3-35 to read the volume display.

Audio volume adjustment settings

Highest # input button lit	dB of attenuation	Output volume	Highest # input button lit	dB of attenuation	Output volume
None	98	0%			
1 Slow blink	63	5.5%	6 Fast blink	31	53.5%
	62	7%	6	30	55%
1 Fast blink	61	8.5%	7 Slow blink	29	56.5%
	60	10%		28	58%
1	59	11.5%	7 Fast blink	27	59.5%
2 Slow blink	58	13%		26	61%
	57	14.5%	7	25	62.5%
2 Fast blink	56	16%	8 Slow blink	24	64%
	55	17.5%		23	65.5%
	54	19%	8 Fast blink	22	67%
2	53	20.5%		21	68.5%
3 Slow blink	52	22%	8	20	70%
	51	23.5%	9 Slow blink	19	71.5%
3 Fast blink	50	25%		18	73%
	49	26.5%	9 Fast blink	17	74.5%
	48	28%		16	76%
3	47	29.5%	9	15	77.5%
4 Slow blink	46	31%	10 Slow blink	14	79%
	45	32.5%		13	80.5%
4 Fast blink	44	34%	10 Fast blink	12	82%
	43	35.5%		11	83.5%
	42	37%	10	10	85%
4	41	38.5%	11 Slow blink	9	86.5%
5 Slow blink	40	40%		8	88%
	39	41.5%	11 Fast blink	7	89.5%
5 Fast blink	38	43%		6	91%
	37	44.5%	11	5	92.5%
	36	46%	12 Slow blink	4	94%
5	35	47.5%		3	95.5%
6 Slow blink	34	49%	12 Fast blink	2	97%
	33	50.5%		1	98.5%
6 Fast blink	32	52%	12	0	100%

= blinking LED

Example 11: Viewing and adjusting an output volume level

In the following example, the audio output volume is viewed and adjusted. The steps show the front panel indications that result from your action.

1. Press and release the Esc button (figure 3-59).

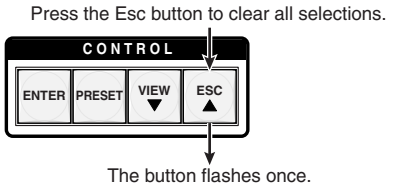


Figure 3-59 — Clear all selections

2. Press and **hold** the Audio button for approximately 2 seconds (figure 3-60).

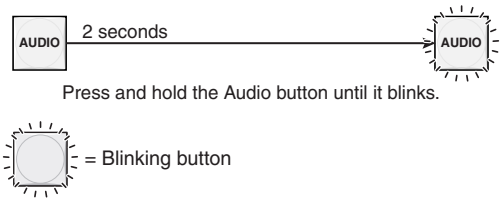


Figure 3-60 — Select* Audio *mode

3. Press and release the output 1 button (figure 3-61).

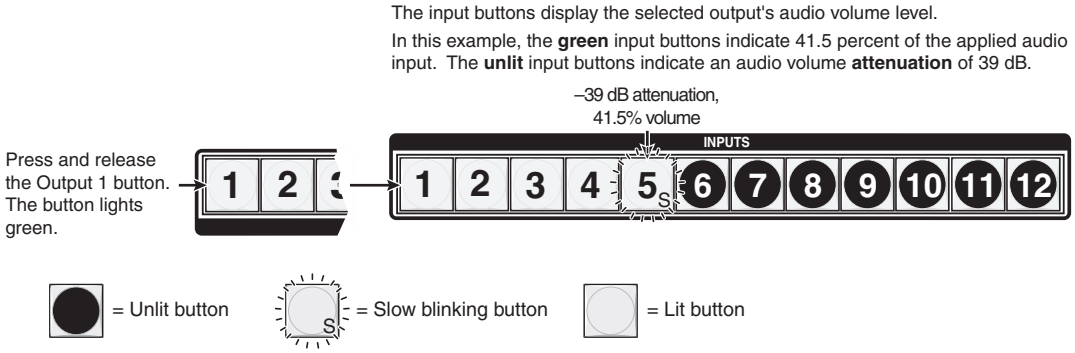

The input buttons display the selected output's audio volume level.
In this example, the green input buttons indicate 41.5 percent of the applied audio input. The unlit input buttons indicate an audio volume attenuation of 39 dB.
–39 dB attenuation,
41.5% volume
INPUTS
Press and release the Output 1 button. The button lights green.
1 2 3 4 5 6 7 8 9 10 11 12
= Unlit button
= Slow blinking button
= Lit button

Figure 3-61 — Select output 17

4. Press and release the Esc (▲) button once (figure 3-62) to increase the volume by 1.5%.

Press and release the Esc (▲) button several more times (figure 3-62) to increase the volume by 1.5% per button push. Note the input button indication changes that occur each time the Esc (▲) button is pressed and released.

NOTE *You can press and **hold** the Esc (▲) or View (▼) button to ramp the level up or down by 3 dB per second to the high or low limit.*

Figure 3-62 show the result of pressing the Esc (▲) button a total of 13 times.

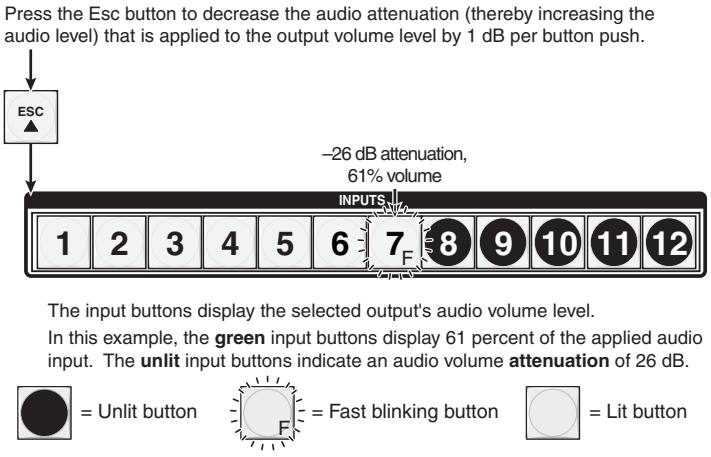


Figure 3-62 — Adjust the output audio volume

5. Press and release the Audio button (figure 3-63).

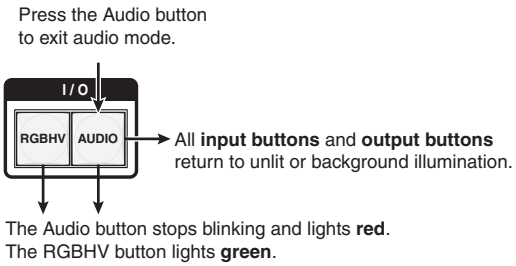

Press the Audio button
to exit audio mode.
I / O
RGBHV
AUDIO
All input buttons and output buttons
return to unlit or background illumination.
The Audio button stops blinking and lights red.
The RGBHV button lights green.

Figure 3-63 — Deselect* Audio *mode

Locking out the front panel (*Executive* mode)

The front panel security lockout limits the operation of the switcher from the front panel. When the switcher is locked, all of the front panel functions are disabled except for the *View-Only* mode functions. See *Viewing a configuration* on page 3-14. Other than in *View-Only* mode, if the user pushes a front panel button when the switcher is locked, the RGBHV and Audio buttons flash twice and return to their previous state.

To toggle the lock on and off, press and hold the RGBHV button and the Audio button for approximately two seconds (figure 3-64).

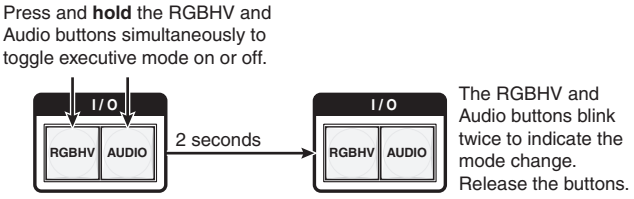

Press and **hold** the RGBHV and Audio buttons simultaneously to toggle executive mode on or off.
I/O
RGBHV
AUDIO
2 seconds
I/O
RGBHV
AUDIO
The RGBHV and Audio buttons blink twice to indicate the mode change. Release the buttons.

Figure 3-64 — Toggle front panel lock on or off

Performing a system reset from the front panel

The front panel reset is identical to the Esc Z X X X ← SIS command (see chapter 4, *Programmer's Guide*). A system reset clears all ties and presets, all video and audio mutes, resets all I/O grouping, sets all input audio levels to unity gain (+0 dB), and sets all output volume levels to 100% (0 dB of attenuation).

Reset the switcher to the factory default settings by pressing and **holding** the RGBHV button and Audio button **while** you apply AC power to the switcher (figure 3-65).

NOTE *System reset does not reset the Internet protocol (IP) settings or replace user-installed firmware.*

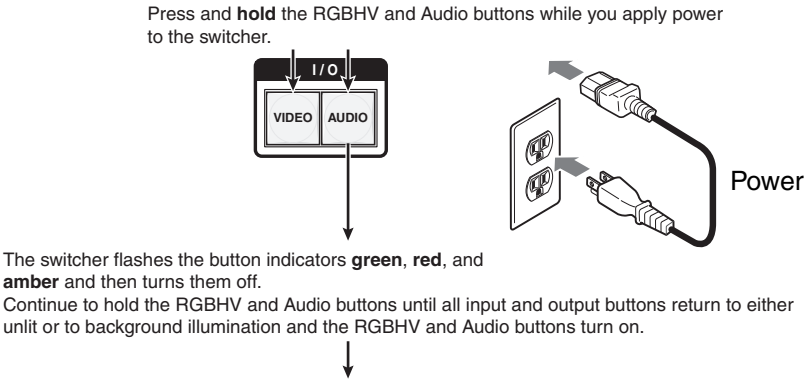

Press and **hold** the RGBHV and Audio buttons while you apply power to the switcher.
I/O
VIDEO
AUDIO
Power
The switcher flashes the button indicators **green**, **red**, and **amber** and then turns them off.
Continue to hold the RGBHV and Audio buttons until all input and output buttons return to either unlit or to background illumination and the RGBHV and Audio buttons turn on.
Release the RGBHV and Audio buttons.

Figure 3-65 — System reset

Background illumination

The buttons on the front panel can be set to provide amber background illumination at all times or the background illumination can be turned off. To toggle the background illumination on or off, press and hold the Input 1 and Input 2 buttons simultaneously for approximately 2 seconds (figure 3-66).

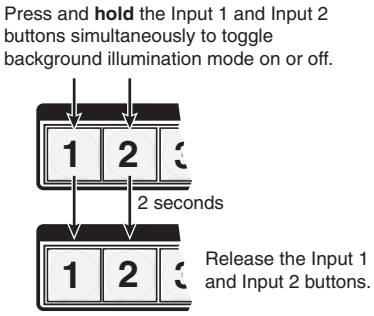

Press and **hold** the Input 1 and Input 2 buttons simultaneously to toggle background illumination mode on or off.
1
2
2 seconds
1
2
Release the Input 1 and Input 2 buttons.

Figure 3-66 — Toggle background illumination on or off

Selecting the RS-232/RS-422 protocol and baud rate

The switcher can support either RS-232 or RS-422 serial communication protocol, and operate at 9600, 19200, 38400, and 115200 baud rates. The settings of these variables can be viewed and changed from the front panel.

View and configure the switcher's serial communications settings as follows:

1. To enter *Serial Port Configuration* mode, simultaneously press and **hold all** Control buttons (Enter, Preset, View, and Esc) (figure 3-67).

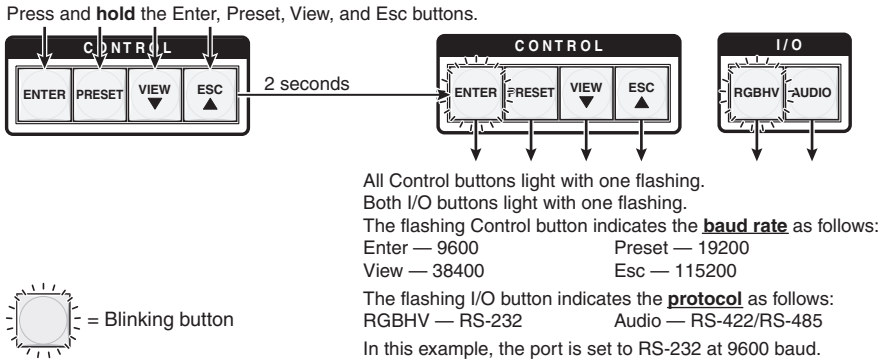


Figure 3-67 — RS-232/RS-422 and baud rate display

2. Release the Control buttons.

3. **To change a value**, press and release the button that relates to the desired value (figure 3-68).

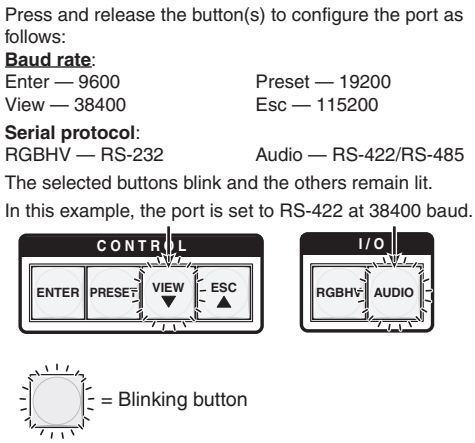


Figure 3-68 — RS-232/RS-422 and baud rate selection

4. Press and release an input or output button to exit the *Serial Port Configuration* mode (figure 3-69).

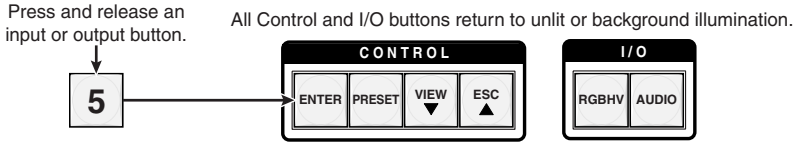


Figure 3-69 — Exit* Serial Port Configuration *mode

Rear Panel Controls

The rear panel has a Reset button that initiates four levels of matrix switcher resets. Press and hold the button while the switcher is running or while you apply power to the switcher for different reset levels.

Performing soft system resets

The switchers have three soft resets available that restore various tiers of switcher settings to their default settings.

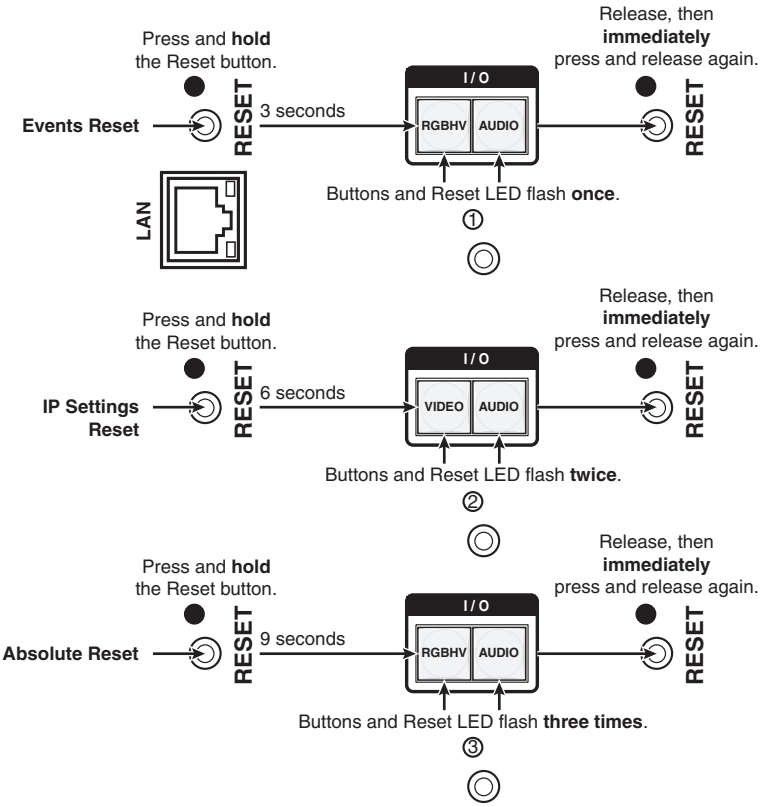
- **Events (mode 3) reset —** This function toggles the monitoring of events on or off (if events monitoring was on, this function turns it off; if it was off, it is turned on).
- **IP settings (mode 4) reset —** The IP settings reset performs the following functions:
  - Enables ARP program capability.
  - Resets the IP address to the factory default (192.168.254.254).
  - Resets the subnet mask to the factory default (255.255.0.0).
  - Resets the gateway address to its factory default (0.0.0.0).
  - Turns DHCP off.
  - Turns events off.

NOTE *IP settings reset does not replace any user-installed firmware.*

- **Absolute (mode 5) reset —** Absolute reset restores the switcher to the default factory conditions. This function is identical to the Esc ZQQQ← SIS command (see chapter 4, *Programmer's Guide*).

Perform a soft reset of the switcher as follows:

1. Press and **hold** the rear panel Reset button until the front panel RGBHV and Audio buttons blink once (events reset), twice (system reset), or three times (absolute reset) (figure 3-70).



NOTE The Reset button on switchers with matrix sizes of 24 x 12 and above have a different appearance and do not have a rear panel Reset LED.

Figure 3-70 — Whole switcher and absolute resets

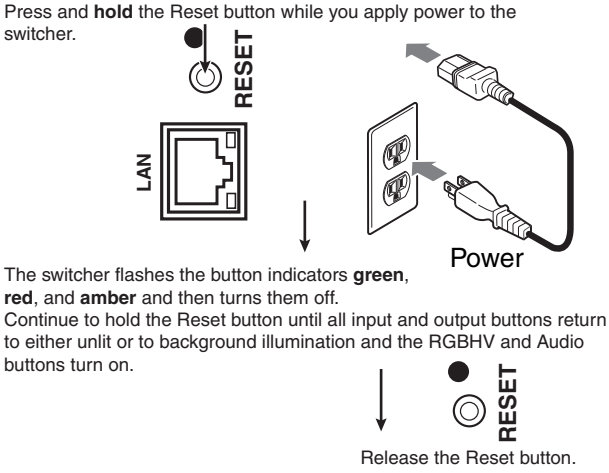
2. Release the Reset button and then immediately press and release the Reset button again. Nothing happens if the second momentary press does not occur within 1 second.

Performing a hard reset

The hard reset function restores the switcher to the base firmware that it was shipped with. After a hard reset, events do not automatically start, but user settings and files are restored. Perform a hard reset as follows:

NOTE *The hard reset restores the factory-installed firmware. The switcher reverts to that factory firmware the next time power is cycled off and on* ***unless*** *a firmware update is performed before the power cycle.*

1. If necessary, turn off power to the switcher.
2. Press and **hold** the Reset button on the rear panel **while** you apply AC power to the switcher (figure 3-71).


Press and **hold** the Reset button while you apply power to the switcher.
RESET
LAN
Power
The switcher flashes the button indicators **green**, **red**, and **amber** and then turns them off.
Continue to hold the Reset button until all input and output buttons return to either unlit or to background illumination and the RGBHV and Audio buttons turn on.
RESET
Release the Reset button.

NOTE The Reset button on switchers with matrix sizes of 24 x 12 and above have a different appearance and do not have a rear panel Reset LED.

Figure 3-71 — Hard reset

Optimizing the Audio

Each individual input audio level can be adjusted within a range of -18 dB to +24 dB, so there are no noticeable volume differences between sources and for the best headroom and signal-to-noise ratio. Adjust the audio gain and attenuation as follows:

1. Connect audio sources to all desired inputs and connect the audio outputs to output devices such as audio players. See *Audio connections*, in chapter 2, *Installation*. For best results, wire all of the inputs and the outputs balanced.
2. Power on the audio sources, the switcher, and the audio players.
3. Switch among the inputs (see *Creating a configuration*, in this chapter), listening to the audio with a critical ear or measuring the output audio level with test equipment, such as a VU meter.
4. As necessary, adjust the input audio level of each input (see *Viewing and adjusting the input audio level*, in this chapter) so that the approximate output level is the same for all selected inputs.
5. As necessary, adjust the output audio level of each input (see *Viewing and adjusting the output volume*, in this chapter).

Troubleshooting

This section gives recommendations on what to do if you have problems operating the switcher, and it describes an actual image problem that Extron has encountered.

1. Ensure that all devices are plugged in and powered on. The switcher is receiving power if one of the front panel Power Supply LEDs is lit green.
2. Check to see if one or more outputs are muted.
3. Ensure an active input is selected for output on the switcher.
4. Ensure that the proper signal format is supplied.
5. Check the cabling and make corrections as necessary.
6. Call the Extron S³ Sales & Technical Support Hotline if necessary.

Configuration Worksheets

Rather than trying to remember the configuration for each preset, use worksheets to record this information. Make copies of the blank worksheet on page 3-47 and use one for each preset configuration. Cross out all unused or inactive inputs and outputs. Use different colors for video and audio.

Worksheet example 1: System equipment

Figure 3-72 shows a worksheet for an MVX 128 in a fictional organization with the system hardware annotated. Inputs 10 and 11 have no connection in this organization, so they have been crossed out on the worksheet.

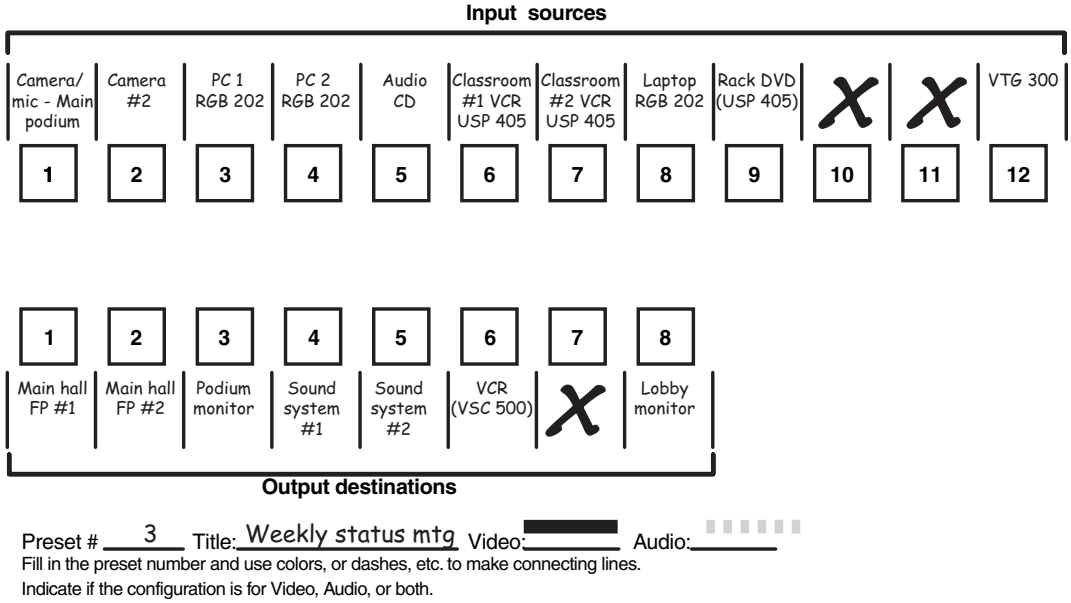


Figure 3-72 — Worksheet example 1: System equipment

Inputs include PCs, an audio CD player, cameras, and an Extron VTG 300. Output devices include monitors, front and rear projectors, a stereo, and a VCR for recording presentations.

The VTG 300 video test generator connected to input 12 enables a video test pattern to be sent to one, several, or all output devices for problem isolation or adjustment purposes. An audio test tape or CD could be used in a similar manner to check out the audio components.

Worksheet example 2: Daily configuration

Figure 3-73 continues from worksheet example 1 by showing the video and audio ties that make up the configuration of preset 1. Solid ink lines shows video ties and dashed pencil lines show the audio ties.

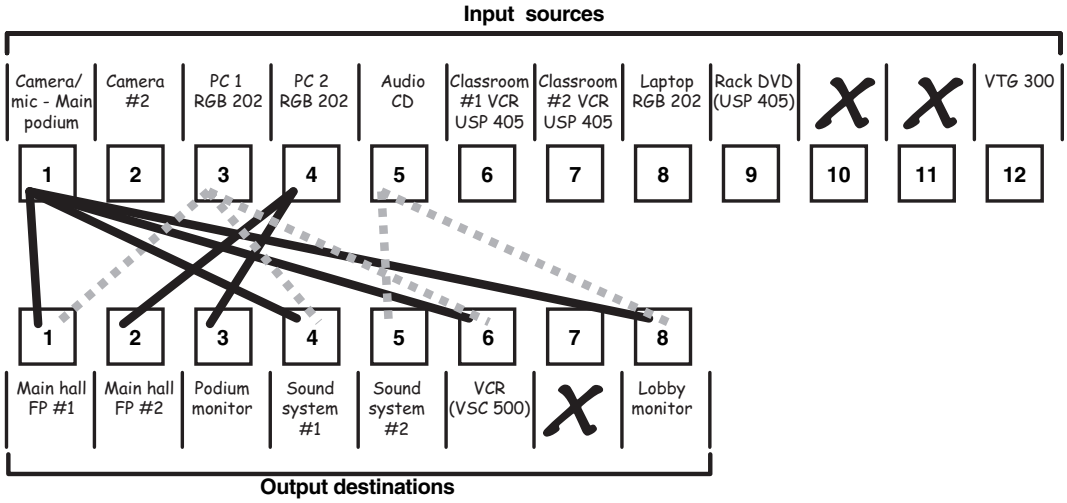


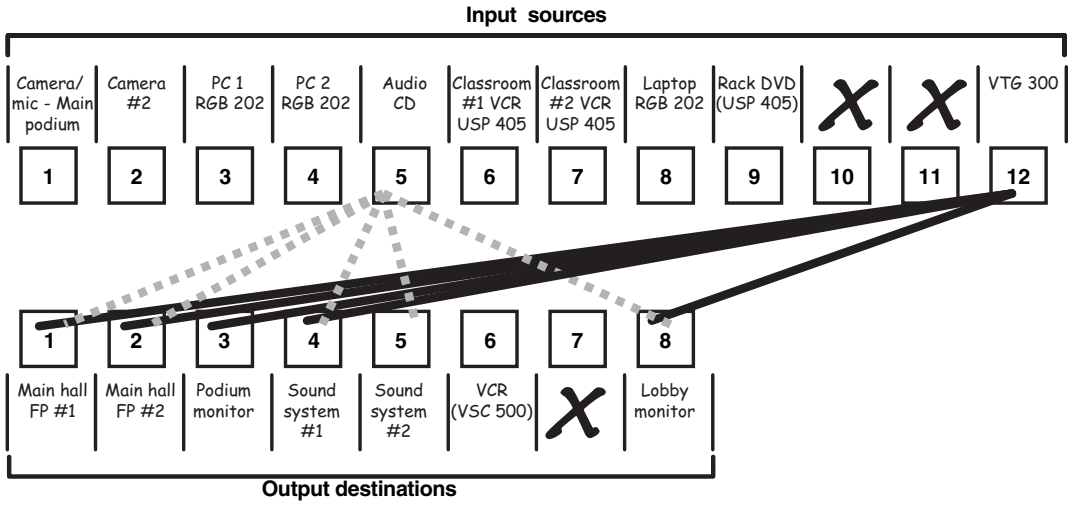
Figure 3-73 — Worksheet example 2: Daily configuration

In this example:

- The image of the presenter, from the main podium camera (input 1), is:
  - Displayed in the main hall (output 1)
  - Displayed in the conference room (output 4) to the overflow crowd
  - Displayed in the lobby (output 8)
  - Tied to the VCR (output 6)
- The presenter has a presentation on her laptop computer (input 4) that is:
  - Displayed in the main hall (output 2)
  - Displayed locally on the podium (output 3)
- The audio from her microphone (input 3) is:
  - Played in the hall (output 1)
  - Played in the conference room (output 4)
  - Sent to the VCR (output 6)
- Classical music from the CD player (input 5) is:
  - Played in the background in the main hall on sound system #2 (output 5)
  - Played in the lobby (output 8)

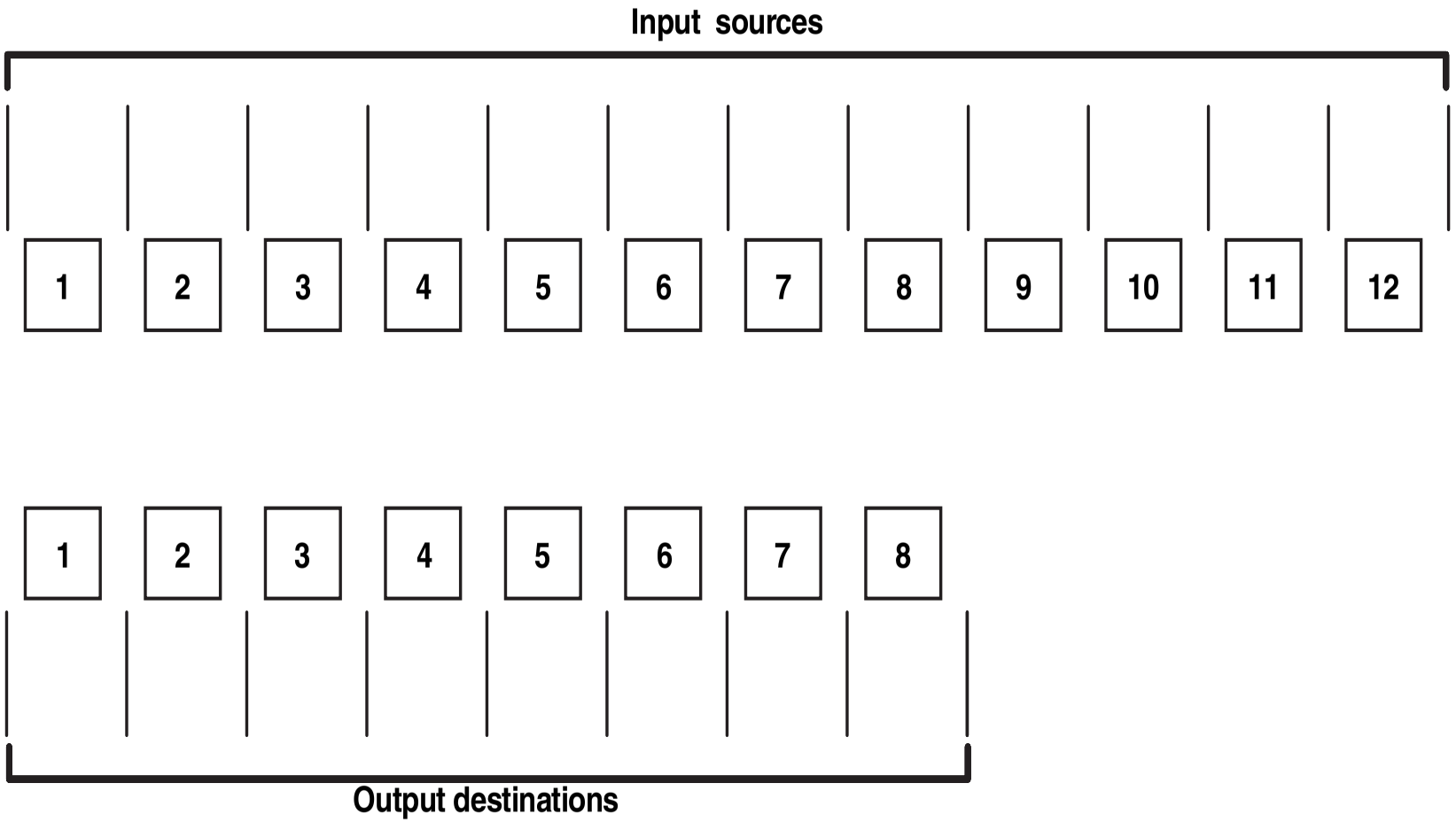
Worksheet example 3: Test configuration

The A/V system in our fictional organization needs to be fine tuned on a regular basis. Figure 3-74 shows a typical test configuration, with an Extron video test generator (input 12) generating a test pattern to all monitors (outputs 1, 2, 3, 4, and 8). Sound checks are run from the CD player (input 5) to all audio systems (outputs 1, 2, 3, 4, and 8).



Preset # 3 Title: Weekly status mtg Video: Audio:
Fill in the preset number and use colors, or dashes, etc. to make connecting lines.
Indicate if the configuration is for Video, Audio, or both.

Figure 3-74 — Worksheet example 3: Test configuration



Preset # _____ Title:_____ Video:_____ Audio:_____

Fill in the preset number and use colors, or dashes, etc. to make connecting lines.

Indicate if the configuration is for video, audio, or both.

Configuration worksheet

4

Chapter Four

Programmer's Guide

RS-232/RS-422 Link

Ethernet Link

Host-to-Switcher Instructions

Switcher-Initiated Messages

Switcher Error Responses

Using the Command/Response Tables

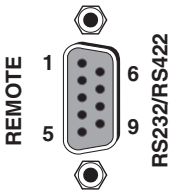
Command/Response Table for SIS Commands

Command Response Table for IP SIS Commands

Special Characters

RS-232/RS-422 Link

The switcher's rear panel Remote 9-pin D female connector (figure 4-1) can be connected to the RS-232 or RS-422 serial port output of a host device such as a computer running the HyperTerminal utility, an RS-232 capable PDA, or a control system. This connection makes software control of the switcher possible.



Pin	RS-232	Function	RS-422	Function
1	—	Not used	—	Not used
2	TX	Transmit data	TX–	Transmit data (–)
3	RX	Receive data	RX–	Receive data (–)
4	—	Not used	—	Not used
5	Gnd	Signal ground	Gnd	Signal ground
6	—	Not used	—	Not used
7	—	Not used	RX+	Receive data (+)
8	—	Not used	TX+	Transmit data (+)
9	—	Not used	—	Not used

Figure 4-1 — Remote connector pin assignments

The default protocol is as follows:

- 9600 baud
- no parity
- 8-bit
- 1 stop bit
- no flow control

NOTE *The MVX Plus 128 switcher can support either RS-232 or RS-422 serial communication protocol, and can operate at 9600, 19200, 38400, or 115200 baud rates. See* Selecting the RS-232/RS-422 protocol and baud rate *in chapter 3,* Operation, *to configure the RS-232/RS-422 port from the front panel.*

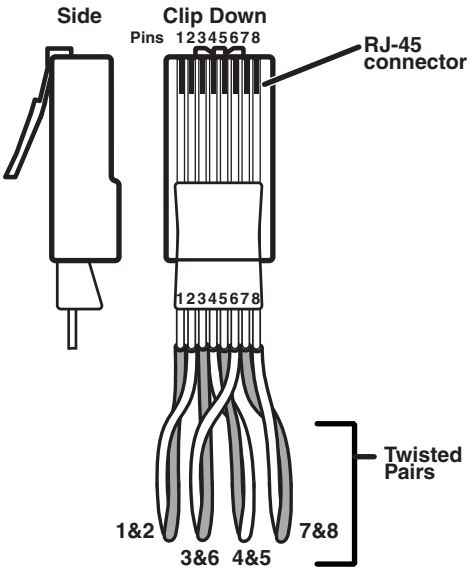
Ethernet Link

The rear panel Ethernet connector on the switcher can be connected to an Ethernet LAN or WAN. This connection makes SIS control of the switcher possible using a computer connected to the same LAN or WAN.

Ethernet connection

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (figure 4-2).

- **Crossover cable** — Direct connection between the computer and the MVX Plus 128 switcher.
- **Patch (straight-through) cable** — Connection of the MVX Plus 128 switcher to an Ethernet LAN.



Patch (straight) cable

Side 1		Side 2	
Pin	Wire color	Pin	Wire color
1	White-orange	1	White-orange
2	Orange	2	Orange
3	White-green	3	White-green
4	Blue	4	Blue
5	White-blue	5	White-blue
6	Green	6	Green
7	White-brown	7	White-brown
8	Brown	8	Brown

Crossover cable

Side 1		Side 2	
Pin	Wire color	Pin	Wire color
1	White-orange	1	White-green
2	Orange	2	Green
3	White-green	3	White-orange
4	Blue	4	Blue
5	White-blue	5	White-blue
6	Green	6	Orange
7	White-brown	7	White-brown
8	Brown	8	Brown

Figure 4-2 — RJ-45 Ethernet connector pin assignments

Default IP addresses

To access the MVX Plus 128 switcher via the Ethernet port, you need the Extron IP address, and may need the subnet mask and the gateway address. If the IP address has been changed to an address comprised of words and characters, you can determine the actual numeric IP address using the ping (ICMP) utility (see appendix A, *Ethernet Connection*, for more details). If the addresses have not been changed, the factory-specified defaults are:

- IP address 192.168.254.254
- Subnet mask 255.255.0.0
- Gateway address 0.0.0.0

Host-to-Switcher Instructions

The switcher accepts SIS (Simple Instruction Set) commands through the RS-232/RS-422 port and Ethernet port. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. Each switcher response to an SIS command ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

Switcher-Initiated Messages

When a local event such as a front panel operation occurs, the switcher responds by sending a message to the host. The switcher-initiated messages are listed below (underlined).

(C) Copyright 2004, Extron Electronics CP 300 450 MAV IP, Vx.xx↵

The switcher initiates the copyright message when it is first powered on or when connection via Internet protocol (IP) is established. Vx.xx is the firmware version number.

↵Password:

The switcher initiates the password message immediately after the copyright message when the controlling system is connected using TCP/IP or Telnet and the switcher is password protected. This message means that the switcher requires an administrator or user level password before it will perform the commands entered via this link. The switcher repeats the password message response for every entry other than a valid password until a valid password is entered.

↵Login Administrator↵

↵Login User↵

The switcher initiates the login message when a correct administrator or user password has been entered. If the user and administrator passwords are the same, the switcher defaults to administrator privileges.

Qik↵

The switcher initiates the Qik message when a front panel switching or preset recall operation has occurred.

Spr*nn*↵

The switcher initiates the Spr message when a memory preset has been saved from the front panel. "*nn*" is the preset number.

In*nn* Aud*xx*↵

The switcher initiates the Aud message when a front panel input audio level change has occurred. "*nn*" is the input number and "*xx*" is the dB level.

Out*nn* Vol*xx*↵

The switcher initiates the Vol message when a front panel output audio volume change has occurred. "*nn*" is the output number and "*xx*" is the volume level.

Vmt*nn***x*↵

The switcher initiates the Vmt message when a video output mute is toggled on or off from the front panel. "*nn*" is the output number and "*x*" is the mute status: 1 = on, 0 = off.

Amt*nn***x*↵

The switcher initiates the Amt message when an audio output mute is toggled on or off from the front panel. "*nn*" is the output number and "*x*" is the mute status: 1 = on, 0 = off.

Exe*n*↵

The switcher initiates the Exe message when executive mode is toggled on or off from the front panel. "*n*" is the executive mode status: 1 = on, 0 = off.

Switcher Error Responses

When the switcher receives an SIS command and determines that it is valid, it performs the command and sends a response to the host device. If the switcher is unable to perform the command because the command is invalid or contains invalid parameters, the switcher returns an error response to the host. The error response codes are:

E01 — Invalid input channel number (too large)
E10 — Invalid command
E11 — Invalid preset number (too large)
E12 — Invalid output number (too large)
E13 — Invalid value (out of range)
E14 — Illegal command for this configuration
E17 — Timeout (caused only by direct write of global presets)
E21 — Invalid room number
E24 — Privilege violation (Ethernet, Extron software only)

Using the Command/Response Tables

The command/response tables begin on page 4-7. Lower-case letters are acceptable in the command field except where indicated for the gain and attenuation commands. The table below shows the hexadecimal equivalent of each ASCII character used in the command/response table.

ASCII to HEX Conversion Table																				Esc	1B	CR	ØD	LF	ØA
Space	2Ø	!	21	"	22	#	23	$	24	%	25	&	26	'	27										
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F										
Ø	3Ø	1	31	2	32	3	33	4	34	5	35	6	36	7	37										
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F										
@	4Ø	A	41	B	42	C	43	D	44	E	45	F	46	G	47										
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F										
P	5Ø	Q	51	R	52	S	53	T	54	U	55	V	56	W	57										
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F										
`	6Ø	a	61	b	62	c	63	d	64	e	65	f	66	g	67										
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F										
p	7Ø	q	71	r	72	s	73	t	74	u	75	v	76	w	77										
x	78	y	79	z	7A	{	7B	I	7C	}	7D	~	7E	DEL	7F										

Symbols are used throughout the table to represent variables in the command/response fields. Command and response examples are shown throughout the table.

Command/Response Table for SIS Commands

Symbol definitions

↵ = CR/LF (carriage return/line feed) (hex 0D 0A)

← = Carriage return (no line feed, hex 0D)
(use the pipe character, |, instead for Web browser commands)

• = Space character

| = Pipe (vertical bar) character

Esc = Escape key (hex 1B)
(use **W** instead of Esc for Web browsers)

X1	= Input number	01 – 12
X2	= Input number (for tie)	00 – 12 (00 = untied)
X3	= Output number	01 – 08
X4	= Numeric dB value	–18 to +24 (45 steps of gain or attenuation)
X5	= Audio gain	0 – 24 (1 dB/step)
X6	= Audio attenuation	1 – 18 (1 dB/step)
X7	= Volume adjustment range	0 – 64 (1 dB/step except for 0-to-1, which is 34 dB) (see the table on page 4-9)
X8	= Room # (for room presets)	10 max. (each can have up to 10 presets (X12s) assigned)

NOTE *A **Room** is a subset of operator-selected outputs that relate to each other. The MVX Plus 128 switcher supports up to 10 **rooms**, each of which can consist of from 1 to 16 outputs.*

X9	= Mute, executive mode, power supply	(0 = off/not OK, 1 = on/OK)
X10	= Group # (for I/O grouping)	1 through 4 groups (0 = no group)
X11	= Global preset #	32 maximum (0 = current configuration)
X12	= Room preset #	10 maximum (0 = current configuration for room)

NOTE *A **Room preset** is a stored configuration with all of the outputs assigned to a single **room**. When a **room preset** is retrieved from memory, it becomes the current configuration.*

X13	= RGB delay interval	Delay in ½ second increments (10 maximum)
X14	= Video/audio mute:	0 = no mutes 1 = video mute 2 = audio mute 3 = video and audio mute
X15	= Sync frequency	xxx.xx (frequency in Hz (V) or kHz (H))
X19	= Firmware version number to second decimal place (*x.xx*)	
X20	= Verbose firmware version-description-upload date/time. See page 4-15.	
X23	= Name	12 characters maximum for global and room preset names 11 characters maximum for room names Upper- and lower-case alphanumeric characters and _ : = / and spaces are valid.

NOTE *The following characters are invalid in the name: {space} ~ , @ = ' [ ] { } < > ' " ; : \| \ and ?.*

X24	= Voltage	Positive or negative voltage and magnitude
X25	= Temperature	Degrees Fahrenheit

Command/response table for SIS commands

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Create ties			
NOTE • *Commands can be entered back-to-back, with no spaces. For example: 1*1!02*02&003*003%4*8$.* • *The quick multiple tie and tie input to all output commands activate all I/O switches simultaneously.* • *The matrix switchers support 1-, 2-, and 3-digit numeric entries (1*1, 02*02, or 001*001).*			
Tie input X2 to output X3, video (V) and audio (A)	X2*X3!	OutX3•InX2•All↵	Tie input X2's video and audio to output X3.
Example:	1*3!	Out03•In01•All↵	Tie input 1 video and audio to output 3.
Tie input X2 to output X3, RGBHV only	X2*X3&	OutX3•InX2•RGB↵	Audio breakaway.
Example (see Note):	10*4&	Out04•In10•RGB↵	Tie input 10 RGB to output 4.
Tie input X2 to output X3, video only	X2*X3%	OutX3•InX2•Vid↵	Audio breakaway.
Example (see Note):	7*5%	Out05•In07•Vid↵	Tie input 7 video to output 5.
NOTE *The & tie command for RGB and the % tie command for video can be used interchangeably on the matrix switchers.*			
Tie input X2 to output X3, audio only	X2*X3$	OutX3•InX2•Aud↵	Audio breakaway.
Example:	12*4$	Out04•In12•Aud↵	Tie input 12 video to output 4.
Quick multiple tie	Esc+QX2*X3!...X2*X3$←	Qik↵	
Example:	Esc+Q3*4!3*5%3*6$←	Qik↵	Tie input 3 video and audio to output 4, tie input 3 video to output 5, and tie input 3 video to output 6.
Tie input to all outputs, V & A	X2*!	InX2•All↵	Audio breakaway.
Example:	5*!	In05•All↵	Tie input 5 video and audio to all outputs.
Tie input to all outputs, RGBHV only	X2*&	InX2•RGB↵	Audio breakaway.
Example (see Note):	8*&	In08•RGB↵	Tie input 8 video to all outputs.
Tie input to all outputs, video only	X2*%	InX2•Vid↵	Audio breakaway.
Example (see Note):	10*%	In10•Vid↵	Tie input 10 video to all outputs.
NOTE *The & tie all command for RGB and the % tie all command for video can be used interchangeably on the matrix switchers.*			
Tie input to all outputs, audio only	X2*$	InX2•Aud↵	Audio breakaway.
Read ties			
Read RGB output tie	X3&	X2↵	RGBHV input X2 tied to output X3.
Read video output tie	X3%	X2↵	Video input X2 tied to output X3.
NOTE *The & read tie command for RGB and the % read tie command for video can be used interchangeably on the matrix switchers.*			
Read audio output tie	X3$	X2↵	Audio input X2 tied to output X3.

Command/response table for SIS commands (continued)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Digital Sync Validation Processing			
List individual sync frequency	X1LS	X15,X15↵	Listed as H freq., V freq.
Example:	2LS	031.50,060.00↵	Input 2 frequency is 31.5 kHz horizontal and 60 Hz vertical.
NOTE *The matrix switcher returns 000.00,000.00 if there is no connection or sync frequencies are not applicable.*			
Video mute commands			
RGB mute	X3*1B	VmtX3*1↵	Mute output X3 RGB (video off).
RGB unmute	X3*0B	VmtX3*0↵	Unmute output X3 RGB (video on).
Read RGB mute	X3B	X9↵	1 = mute on, 0 = mute off.
Global RGB mute	1*B	Vmt1↵	Mute all RGB outputs.
Global RGB unmute	0*B	Vmt0↵	Unmute all RGB outputs.
RGB delay			
Set RGB delay	EscX3*X13D←	OutX3•DlyX13↵	
Example:	Esc13*7D←	Out13•Dly07↵	Set the RGB interval for switches to output 13 to 3.5 seconds (7 x 0.5 seconds).
Read RGB delay	EscX3D←	X13↵	
Example:	Esc14D←	05↵	Output 14 interval is 2.5 seconds (5 x 0.5 seconds).
Audio input gain and attenuation			
NOTE *The set gain (**G**) and set attenuation (**g**) commands **are** case sensitive.*			
Set input audio gain to +dB value	X1*X5G	InX1•AudX4↵	
Example:	1*2G	In01•Aud+02↵	Set input 1 audio gain to +2 dB.
Set input audio attenuation to -dB value	X1*X5g	InX1•AudX4↵	
Increment gain	X1+G	InX1•AudX4↵	Increase gain by 1 dB.
Example:	5+G	In05•Aud+03↵	Audio input 5 level incremented from +2 dB to +3 dB.
Decrement gain	X1-G	InX1•AudX4↵	Decrease gain by 1 dB.
Example:	7-G	In07•Aud-09↵	Audio input 7 level decremented from -8 dB to -9 dB.
Read input gain	X1G	X4↵	
Audio output volume			
NOTE *The table on page 4-9 defines the value of each audio volume step.*			
Set the audio volume to a specific value	X3*X7V	OutX3•VolX7↵	
Example:	1*50v	Out01•Vol50↵	Set output 1 volume to 79%.
Increment volume	X3+V	OutX3•VolX7↵	Increment volume by 1 step.
Example:	1+V	Out01•Vol51↵	
Decrement volume	X3-V	OutX3•VolX7↵	Decrease volume by 1 step.
Read output volume	X3V	X7↵	

Audio volume adjustment settings

X7 value	dB of attenuation	Output volume	X7 value	dB of attenuation	Output volume	X7 value	dB of attenuation	Output volume
00	98	0%						
01	63	5.5%	23	41	38.5%	45	19	71.5%
02	62	7%	24	40	40%	46	18	73%
03	61	8.5%	25	39	41.5%	47	17	74.5%
04	60	10%	26	38	43%	48	16	76%
05	59	11.5%	27	37	44.5%	49	15	77.5%
06	58	13%	28	36	46%	50	14	79%
07	57	14.5%	29	35	47.5%	51	13	80.5%
08	56	16%	30	34	49%	52	12	82%
09	55	17.5%	31	33	50.5%	53	11	83.5%
10	54	19%	32	32	52%	54	10	85%
11	53	20.5%	33	31	53.5%	55	9	86.5%
12	52	22%	34	30	55%	56	8	88%
13	51	23.5%	35	29	56.5%	57	7	89.5%
14	50	25%	36	28	58%	58	6	91%
15	49	26.5%	37	27	59.5%	59	5	92.5%
16	48	28%	38	26	61%	60	4	94%
17	47	29.5%	39	25	62.5%	61	3	95.5%
18	46	31%	40	24	64%	62	2	97%
19	45	32.5%	41	23	65.5%	63	1	98.5%
20	44	34%	42	22	67%	64	0	100%
21	43	35.5%	43	21	68.5%			
22	42	37%	44	20	70%			

Command/response table for SIS commands (continued)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Audio mute commands			
Audio mute	X3*1Z	AmtX3*1↵	Mute output X3 audio (audio off).
Audio unmute	X3*0Z	AmtX3*0↵	Unmute output X3 audio (audio on).
Read audio mute	X3Z	X9↵	1 = mute on, 0 = mute off.
Global audio mute	1*Z	Amt1↵	Mute all audio outputs.
Global audio unmute	0*Z	Amt0↵	Unmute all audio outputs.
Names			
Write global preset name	EscX11,X23NG←	NmgX11,X22↵	
Example:	Esc1,Security 1NG←	Nmg01,Security 1↵	Name global preset 1 "Security 1".
Read global preset name	EscX11NG←	X23↵	
Example:	Esc2NG←	Security 2↵	
Write room name	EscX8,X23NR←	NmrX8,X23↵	
Example:	Esc1,Classrm 1NR←	Nmr01,Classrm 1↵	Name room 1 "Classrm 1".
Read room name	EscX8NR←	X23←	
Write room preset name	EscX8*X12,X23NP←	NmpX8*X12,X23↵	
Example:	Esc1*3,Podium_DVDNP←	Nmp01*3,Podium_DVD↵	Name room1, preset 3 "Podium_DVD".
Read room preset name	EscX8,X12NP←	X23↵	
NOTE	• *If a preset is unassigned, the X2# displays* [unassigned].		
	• *If a global preset is saved, but not yet named, the default name is* Preset X11.		
	• *If a room preset is saved, but not yet named, the default name is* RmX8 PrstX12.		
Write input name	EscX1,X23NI←	NmiX1,X23↵	
Example:	Esc1,Podium camNI←	Nmi01,Podium cam↵	Name input 1 "Podium cam".
Read input name	EscX1NI←	X23↵	
Write output name	EscX1,X23NO←	NmoX1,X23←	
Example:	Esc1,Main PJ1NO←	Nmo01,Main PJ1↵	Name output 1 "Main PJ1".
Read output name	EscX1NO←	X23↵	
I/O Grouping			
NOTE	*The group that is assigned in each of the following I/O grouping commands (X10) must be 1, 2, 3, 4, or 0 (not grouped).*		
Write input grouping	EscX10[1]X10[2]...X10[12]I←	GrIX10[1]X10[2]X10[3]...X10[12]↵	Each X10 entry is the group number assigned to an input position, starting from input 1.
Example:	Esc401330000444I←	See below.	
	Input 1 in group 4; Input 2 not grouped; Input 12 in group 4 Response #s = group: GrI 4 0 1 3 3 0 0 0 0 4 4 4↵ Input: 01 02 03 04 05 06 07 08 09 10 11 12		Input 1 - Group 4, Input 2 - Group 0 (not grouped), ... Input 12 - Group 4.
Write output grouping	EscX10[1]X10[2]...X10[12]O←	GroX10[1]X10[2]X10[3]...X10[12]↵	Each X10 entry is the group number assigned to an output position, starting from output 2.
Read input grouping	EscI←	X10[1]X10[2]X10[3]...X10[12]↵	
Example:	EscI←	See below.	
	Input 1 in group 1; Input 8 not grouped; Input 12 in group 4 Response = group: 1 1 1 3 3 0 0 0 0 4 4 4↵ Input: 01 02 03 04 05 06 07 08 09 10 11 12		
Read output grouping	EscO←	X10[1]X10[2]X10[3]...X10[12]↵	

Command/response table for SIS commands (continued)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Save, recall, and directly write presets			
NOTE • *If you try to recall a preset that is not saved, the matrix switcher responds with the error code* E11. • *If a room is not defined (does not exist in the switcher), the matrix switcher responds with the error code* E21. • *The following characters are invalid in preset names:* + - , ` @ = [ ] { } ‘ “ ; : | \ and ?.			
Save current configuration as a global preset	X11,	Spr X11 ↵	Command character is a comma.
Example:	9,	Spr9↵	Save current ties as preset 9.
Recall a global preset	X11.	Rpr X11 ↵	Command character is a period.
Example:	5.	Rpr05↵	Recall preset 5, which becomes the current configuration.
Save current ties for a room	X8*X12,	Rmm X8 •Spr X12 ↵	Command character is a comma.
Example:	3*9,	Rmm03•Spr09↵	Save current ties as preset 9 for room 3.
Direct write process — **NOTE** *The* direct **write** of a global preset *should always be preceded by a* **clear** global preset ties *command of that same preset number, as shown below. In a directly-written preset, each output position's tied input (or no tied input) remains unchanged unless overwritten or cleared.* *If you do not* ***clear*** *the ties in a global preset number before you directly* ***write*** *a global preset to that number, ties that are part of the previous version of the specified preset with the same number can unexpectedly become part of the newly-created preset.*			
Clear a global preset's ties	Esc+X11P0*! ←	Spr X11 ↵	Clear all ties in preset X11.
Directly write a global preset	Esc+X11PX2*X3!X2*X3%X2*X3$ ... X2*X3& ← Spr X11 ↵		The tie all (!), tie RGBHV (&), tie video (%), and tie audio ($) commands are all valid.
Example:	Esc+27P0*! ← Esc+27P12*5!10*09%3*2$3*8& ← Spr27↵	Spr27↵	Clear all ties in preset 27. Brackets are shown to separate ties for clarity only. Create global preset 27, which ties video and audio input 12 to output 5, RGBHV input 10 to output 9, video input 3 to output 2, and audio input 3 to output 8.
Write room outputs	Esc X8,Y1,Y2, ... Yn MR ←	Mpr X8,Y1,Y2, ... Yn ↵	See notes.
NOTE • *Each* Y# *is an output.* • *A room can contain a maximum of 16 outputs.* • *An output can belong to only one room.* • *The maximum number of rooms (X8) is 10.*			
Example:	Esc 8,3,04,5,6MR ←	Mpr8,03,04,05,06↵	Outputs 3, 4, 5, and 6 are assigned to room 8.
Read room outputs	Esc X8 MR ← Esc 3MR ←	X23,Y1,Y2, ... Yn ↵ Class 1,01,02,08,09↵	Outputs 1, 2, 8, and 9 are assigned to room 3, which named “Class 1”.
Recall room preset	X8*X12.	Rmm X8 •Rpr X12 ↵	Command character is a period.

Command/response table for SIS commands (continued)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Save, recall, and directly write presets (continued)			
Directly write a room preset	Esc+X8*X12PX2*X3!X2*X3%X2*X3$ ... X2*X3& ←	Rmm X8 ● Spr X12 ↵	Enter as many ties as are valid for this model. Tie all (!), tie RGBHV (&), tie video (%), and tie audio ($) commands are all valid.
Example:	Esc+7*3P12*7&11*5$4*5%6*6! ←	Rmm07●Spr03↵	Brackets are shown to separate ties for clarity only. Create preset 3 for room 7, which ties audio input 12 to output 7, video input 11 to output 5, RGBHV input 4 to output 5, and video and audio input 6 to output 6.
Executive mode			
Lock front panel	1X	Exe1↵	Enable executive mode.
Unlock front panel	0X	Exe0↵	Disable executive mode.
View lock status	X	X9↵	
Resets			
Reset global presets and names	EscZG←	Zpg↵	Clear all global presets and their names.
Reset **one** global preset	EscX11ZG←	ZpgX11↵	Clear global preset X11.
Reset RGB delays	EscZD←	Zpd↵	Reset all RGB delays to 0.0 seconds.
Reset audio input levels	EscZA←	Zpa↵	Rest all audio input levels (gain and attenuation) to 0 dB.
Rest audio output levels	EscZV←	Zpv↵	Reset all audio output levels (volume) to 100% (no attenuation).
Reset all mutes	EscZZ←	Zpz↵	Reset all video and audio mutes.
Reset room map	EscZR←	Zpr↵	Clear all room presets.
Reset individual room	EscX8ZR←	ZprX8↵	Clear all presets for room X8.
Reset individual room preset	EscX8*X12ZP←	ZppX8*X12↵	Clear an individual room preset and name.
Reset flash	EscZFFF←	Zpf↵	Reset flash memory (erase all user-supplied files).
Reset whole switcher	EscZXXX←	Zpx↵	Clear all ties and presets, reset all audio gains to 0 dB, and reset volume to 100%.
Absolute reset	EscZQQQ←	Zpq↵	Similar to **Reset whole switcher**, plus clear the IP address to 192.168.254.254 and subnet mask to 255.255.000.000.

Command/response table for SIS commands (continued)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
View ties, gain, volume, mutes, presets, and DSVP			
View RGBHV output tie	X3&	X2↵	
Example:	15&	27↵	Input 27 RGBHV is tied to output 15.
View video output tie	X3%	X2↵	
Example:	7%	02↵	Input 2 video is tied to output 7.
View audio output tie	X3$	X2↵	
Example:	3$	06↵	Input 6 audio is tied to output 3.
View input gain	X2G	X4↵	
Example:	4G	-02↵	Gain for input 4 is -2 dB.
View output volume	X2V	X7↵	
Example:	7V	55↵	Volume for output 7 is 55%.
View output mutes	Esc VM←	X14[1], X14[2], ... X14[8]Mut↵	Each X14 response is the mute status of an output, starting from output 1.
Example:	Esc VM←	02301000Mut↵	Output 2 audio is muted, output 3 video and audio are muted, and output 5 video is muted. All other outputs are unmuted.
View video global preset configuration	Esc X11*1*1VC←	X2[1]•X2[2]•...•X2[16]•Vid↵	Show preset X11's video configuration. Show the input tied to 16 sequential outputs (12 are present on this model), starting from output 1.
Command description:	preset #*starting output # (O# - should always be *1*)**1*(=video)*VC*		
Response description:	input # (I#) tied to O#1•I# tied to O#2•I# tied to O#3• ... •I# tied to O#12•*Vid*↵		
Example:	Response = tied input: 08•08•12•08•08•11•00•00•--•--•--•--•--•--•--•--•Vid↵ Output: 1 2 3 4 5 6 7 8 09 10 11 12 13 14 15 16 (input 12 tied to output 3; input 8 tied to output 4; no tied input; outputs do not exist)		Each position shown in the response is an output: left = output 1, right = output 16. (Outputs 9 through 16 are not present on the MVX Plus 128.) The number in each position is the input tied to that output. In this example, video input 8 is tied to outputs 1, 2, 4, and 5; input 12 is tied to output 3; and input 11 is tied to output 6. No inputs are tied to outputs 7 and 8.
View audio global preset configuration	Esc X11*1*2VC←	X2[1]•X2[2]•...•X2[16]•Aud↵	Show preset X11's audio configuration. Show the input tied to 16 sequential outputs (12 are present on this model), starting from output 1.
Command description:	preset #*starting output # (O# - should always be *1*)**2(=audio)*VC*		
Response description:	input # (I#) tied to O#1•I# tied to O#2•I# tied to O#3• ... •I# tied to O#12•*Aud*↵		
Example:	Response = tied input: 01•01•01•01•02•12•12•00•--•--•--•--•--•--•--•--•Aud↵ Output: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 (input 1 tied to output 3; no tied input; outputs do not exist)		Each position shown in the response is an output: left = output 1, right = output 16. (Outputs 9 through 16 are not present on the MVX Plus 128.) The number in each position is the input tied to that output. In this example, audio input 1 is tied to outputs 1, 2, 3, and 4; input 2 is tied to output 5, input 12 is tied to outputs 6 and 7. No input is tied to output 8.

Command/response table for SIS commands (continued)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
View ties, gain, volume, mutes, presets, and DSVP (continued)			
View video room preset configuration	Esc X8 * X12 *1*1VC ←	X2[1] • X2[2] • ... • X2[16] • Vid ↵	Show room X8, preset X11's video configuration. Show the input tied to up to 16 outputs assigned to room X8.
Command description:	room #*room preset #*starting output # (O# - should always be *1)*1*(=video)*VC*		
Response description:	input # (I#) tied to O#1 • I# tied to O#2 • I# tied to O#3 • ... • I# tied to O#12 • *Vid* ↵		
View audio room preset configuration	Esc X8 * X12 *1*2VC ←	X2[1] • X2[2] • ... • X2[16] • Aud ↵	Show room X8, preset X11's audio configuration. Show the input tied to up to 16 outputs assigned to room X8.
Command description:	room #*room preset #*starting output # (O# - should always be *1)*2*(=audio)*VC*		
Response description:	input # (I#) tied to O#1 • I# tied to O#2 • I# tied to O#3 • ... • I# tied to O#12 • *Aud* ↵		
NOTE *The response to the ViewFile Directory command differs, depending on whether the command is sent via an RS-232/RS-422 or Telnet connection or sent via a Web browser connection.*			
View file directory RS-232/RS-422 port and Telnet	Esc DF ←	*filename*1,*date/time*,*length* ↵ *filename*2,*date/time*,*length* ↵ *filename*3,*date/time*,*length* ↵ • • • • *filename*n,*date/time*,*length* ↵ # *of* Bytes • Left ↵ ↵	List user-supplied files.
View file directory Web browser	Esc DF ←	Var file = new array (); File [1] = '*filename*1,*date*1,*filesize*1'; File [2] = '*filename*2,*date*2,*filesize*2'; File [3] = '*filename*3,*date*3,*filesize*3'; • • • • File [*n*] = '*filename*n,*date*n,*filesize*n'; File [*n+1*] = # *of* Bytes • Left	List user-supplied files.
Erase user-supplied Web pages/files	Esc *filename* EF ←	Del*filename* ↵	
View DSVP (sync frequency)	X1 LS	X15 , X15 ↵	Listed as H freq., V freq.
Information requests			
Information request	I	V12X08 • A12X08 ↵	
Request part number	N	60-788-01 ↵	
NOTE *There are up to three separate sets of Extron firmware that the switcher can report on: the controller firmware, which is the overall control firmware; the Ethernet protocol firmware, which handles the Ethernet interface; and the latest optional Extron firmware update, which is available at www.Extron.com.*			
Query controller firmware version	Q	X19 ↵	
Example:	Q	1.23 ↵	The factory-installed controller firmware version is 1.23 (sample value only).

Command/response table for SIS commands (continued)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Information requests (continued)			
Query controller firmware version (verbose)	0Q	X19-X20-X20↵	Provide a detailed status of the Ethernet protocol firmware, the controller firmware, and any firmware upgrade. The firmware that is running is marked by an asterisk (*). A caret (^) indicates that the firmware has a bad checksum or an invalid load. ?.?? indicates that firmware is not loaded.
Response description:		*Ethernet protocol firmware version-controller firmware version-updated firmware version*↵	
Example:	0q		

Description | * indicates the version running | Upload date and time

Response: 1.23-0.14(0.20-32x32 Series - , 00 2000 00:00:00 GMT)-0.25*(0.24-32x32 Series -Thu, 20 Mar 2003 16:39:21 GMT)↵

Ethernet protocol firmware | CrossPoint/MAV firmware version | Updated firmware version

Request system status	S	X24•X24•X24•X24•X24•X25↵	
Response description:		*+3.3V•+5V•-5V•+15V•-15V•temperature (degrees fahrenheit)*↵	
Example:		3.29•5.04•-5.14•15.27•-15.15•120.20↵	

-15V power system at -15.15V

3.3V power system at 3.29V | Temperature 120.20 degrees

Command/Response Table for IP SIS Commands

Symbol definitions

X30 = Matrix name — (Up to 240 alphanumeric characters)

NOTE *The following characters are invalid in the name: {space} ~ , @ = ` [ ] { } < > ' " ; : | \ and ?.*

X31 = Default name — CP-300-450-MAV-- + last 3 pairs of MAC address

X32 = Time and date (for set) — In the format: MM/DD/YY●HH:MM:SS *where*:
MM = month: 01 (January) through 12 (December)
DD = 01 through 31
YY = 00 through 99
HH = 00 through 24
MM = 00 through 59
SS = 00 through 59

X33 = Time and date (for read) — In the format: Day,•DD•Mmm●YYYY•HH:MM:SS *where*:
Day = weekday: Mon through Sun
DD = 01 through 31
Mmm = month: Jan through Dec
YYYY = 2000 through 2099
HH = 00 through 24
MM = 00 through 59
SS = 00 through 59

X34 = GMT offset — –12.0 through +14.0. Hours and minutes removed from GMT

X35 = Daylight Savings Time — 0 = Daylight Savings Time off/ignore
1 = Daylight Savings Time on (northern hemisphere)
2 = Daylight Savings Time on (Europe)
3 = Daylight Savings Time on (Brazil)

X36 = IP address — ###.###.###.###

X37 = Hardware (MAC) address — ##-##-##-##-##-##

X38 = Number of open connections — 0 - 255

X39 = Password — 12 alphanumeric characters

NOTE *The following characters are invalid in passwords: {space} + ~ , @ = ` [ ] { } < > ' " ; : | \ and ?.*

X40 = Domain name — Standard domain name rules apply (for example: *nnnnn@xxx.com*)

NOTE *The following characters are invalid in a domain name: {space} + ~ , = ` [ ] { } < > ' " ; : | \ and ?. The @ character is acceptable only as the lead-in to the domain name (such as @extron.com).*

X41 = E-mail account — 65 - 72. 65 = e-mail recipient 1, 66 = 2, 67 = 3, ... 72 = recipient #8

X42 = E-mail address — Typical e-mail address format (for example: *nnnn@xxx.com*)

X43 = Notify when? — 0 = no response 2 = fixed/restored
1 = fail/missing 3 = both 1 & 2

X44 = Notification selections — 01 through 12 = input 1 through input 12
13 through 16 = not used
17 = power supply

X45 = Notify status (for read) — 17-digit number. For each digit: 0 = do not notify, 1 = notify

X46 = DHCP — 0 =1 off, 1 = on

X47 = Port # — 00 through 99 (00 = all ports)

X48 = Baud rate — 9600, 19200, 38400, 115200

X49 = Parity — **o**dd, **e**ven, **n**one, **m**ark, **s**pace (only first letter required)

X50 = Data bits — 7, 8

X51 = Stop bits — 1, 2

X52 = Port type — 0 = RS-232
1 = RS-422
2 = RS-485

X53 = Verbose mode — 0 = clear/none (default for Telnet connection)
1 = verbose mode (default for RS-232/RS-422 connection)
2 = tagged responses for queries
3 = verbose mode and tagged for queries

NOTE *If tagged responses is enabled, all read commands return the constant string and the value as the set command does (for example, the read matrix name command Esc CN ←, returns Ipn● X30 ←┘).*

X54 = RAM status — 0 = RAM dirty (needs saving to flash memory)
1 = RAM has been saved (ok to power off/reset)

Command/response table for IP SIS commands

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
IP setup commands			
Set matrix name	Esc X30 CN ←	Ipn● X30 ↵	
Read matrix name (location	Esc CN ←	X30 ↵	
Reset matrix name to factory default	Esc● CN ←	Ipn● X30 ↵	
Set time and date	Esc X32 CT ←	Ipt X32 ↵	
Read time and date	Esc CT ←	X33 ↵	
Set GMT offset	Esc X34 CZ ←	Ipz X34 ↵	In the command, the divider between hours and minutes can be either a colon or a period. In the response, the divider is a colon.
Example:	Esc 8.0CZ ←	Ipz+08:00 ↵	
Set Daylight Savings Time	Esc X35 CX ←	X35 ↵	
Read Daylight Savings Time	Esc CX ←	X35 ↵	
Set IP address	Esc X36 CI ←	Ipi X36 ↵	
Read IP address	Esc CI ←	X36 ↵	
Read hardware address	Esc CH ←	X37 ↵	
Read # of open connections	Esc CC ←	X38 ↵	
Set subnet mask	Esc X36 CS ←	Ips X36 ↵	
Read subnet mask	Esc CS ←	X36 ↵	
Set gateway IP address	Esc X36 CG ←	Ipg X36 ↵	
Read gateway IP address	Esc CG ←	X36 ↵	
Set administrator password	Esc X39 CA ←	Ipa● X39 ↵	
Read administrator password	Esc CA ←	X39 ↵	
Reset (clear) administrator password	Esc● CA ←	Ipa●↵	
Set user password	Esc X39 CU ←	Ipu● X39 ↵	
Read user password	Esc CU ←	X39 ↵	
Reset (clear) user password	Esc● CU ←	Ipu●↵	
Set mail server, domainname	Esc X36,X40,X39 CM ←	Ipm X36,X40,X39 ↵	
Read mail server, domainname	Esc CM ←	X36,X40,X39 ↵	
Set e-mail recipient	Esc X41,X42 CR ←	Ipr X41,X42,↵	This command sets the recipient. To receive e-mail notifications, you must then set the events that the switcher reports, using one or more separate *Set e-mail events (EM)* commands (see next page).
Example:	Esc 72,Jsmith@folklore.netCR ←	Ipr72,Jsmith@folklore.net,↵	
Read e-mail recipient	Esc X41 CR ←	X42,↵	

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
IP setup commands (continued)			
Set e-mail events for recipient	Esc X41,X43,X44,X44, ... X44Em←	X43,X44↵	You must first have set an e-mail recipient for the e-mail account number (X41), using the separate Set e-mail recipient (CR) command.
Example:	Esc72,3,1,2,8,17EM←	See below	E-mail account #72, JSmith, will receive fail/missing and fixed/restored messages for inputs signals 1, 2, and 8 and the power supply.
Response description	*Notify when?, inputs 1 - 16 (13 through 16 not present on this model) PS*↵ Notify failed and fixed — E-mail input 8 status Response: 3,1 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 1↵ Input: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 Power Supply Inputs not present		
Read e-mail events for recipients	Esc72EM←	X44↵	
Set DHCP on or off	Esc X46DH←	IdhX46↵	
Read DHCP on/off status	EscDH←	X46↵	
Read parameters	Esc X47CP←	X48,X49,X50,X51↵	
Set mode	Esc X47*X52CY←	CpnX47•CtyX52↵	
Read mode	Esc X47CY←	X52↵	
Set verbose mode	Esc X53CV←	VrbX53↵	
Read verbose mode	EscCV←	X53↵	
Commit RAM to flash memory	Esc1FF←	NvrX54↵	
Check RAM	EscFF}	X54↵	

Special Characters

The HTML language reserves certain characters for specific functions. The switcher does not accept these characters as part of preset names, the switcher's name, passwords, or locally created file names.

The switcher rejects the following characters:
{space (spaces **are** ok for names)} + ~ , @ = ‘ [ ] { } < > ’ “ semicolon (;) colon (:) | \ and ?.

Chapter Five

Matrix Software

Matrix Switchers Control Program

Button Label Generator Program

Matrix Software

Two software programs accompany the MVX Plus 128 switcher:

- The Extron Matrix Switcher+ Control Program, which communicates with the switcher via the RS-232/RS-422 port and the Ethernet port, provides an easy way to set up ties and sets of ties.
- The Extron Button-Label Generator, which allows you to design and print labels for the MVX Plus 128 front panel buttons.

Both programs are compatible with Windows 95/98, Windows NT, Windows ME, Windows 2000, and Windows XP. Updates to these programs can be downloaded from the Extron Web site (http://www.extron.com).

Matrix Switchers Control Program

Installing the software

The program is contained on a set of 3.5-inch diskettes. Load and run the program from the hard drive.

To install the program from the floppy disk to the hard drive, run Setup.exe from the floppy disk and follow the instructions that appear on the screen. The program occupies approximately 1 MB (megabyte) of hard-drive space.

By default, the Windows installation creates a C:\MTRX50 directory and places two icons (MATRIX Switcher+ Control Program and MATRIX Switcher+ Help) into a group or folder named "Extron Electronics".

NOTE *The program was designed to control most Extron matrix switchers, but its operation is limited to the features and configuration of your switcher.*

NOTE *The MVX Plus 128 switcher can support either RS-232 or RS-422 serial communication protocol, and operate at 9600, 19200, 38400, or 115200 baud rates. See* Selecting the RS-232/RS-422 protocol and baud rate *in chapter 3,* Operation, *to configure the RS-232/RS-422 port from the front panel.*

Software operation via Ethernet

When an MVX Plus 128 switcher is connected to an Ethernet WAN or LAN, any number of users can operate it, locally or remotely, using the Matrix Switcher+ Control Program. See *Ethernet connection* in chapter 2, *Installation*, for installation details.

Connection to the switcher via the Ethernet is password protected. There are two levels of password protection: administrator and user. Administrators have full access to all MVX Plus 128 switching capabilities and editing functions. Users can select inputs and outputs, set and recall presets, and view all settings with the exception of passwords. If the same password or no password is required for logging on, all personnel log on with administrator privileges. Fields and functions that exceed user privileges are grayed out in the Matrix Switcher+ Control Program when the operator is logged on as a user.

Ethernet protocol settings

The IP Settings/Options screen (figure 5-5 on page 5-6) provides a location for viewing and, if connected via the RS-232 link or if logged on via the Ethernet port as an administrator, editing settings unique to the Ethernet interface. See *IP Settings/Options window,* later in this chapter, for more details.

Using the software

Many items found in the Matrix Switcher+ Control Program are also accessible via front panel controls (see chapter 3, *Operation*) and under SIS control (see chapter 4, *Programmer's Guide*). The Matrix Switcher+ Help Program provides information on settings and on how to use the control program itself.

1. To run the Matrix Switcher+ Control Program, double-click on the Matrix Switcher+ Control Program icon (shown at right) in the Extron Electronics group or folder.

The Comm Port Selection window (figure 5-1) appears.

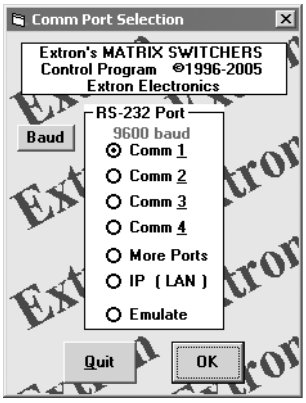


Figure 5-1 — Comm port selection window

2. Choose either the comm port that is connected to the MVX Plus 128 switcher's RS-232/RS-422 port, *IP [LAN]*, or *Emulate*.

- **If you selected a comm port**, check the baud rate displayed in the comm port selection window. If you need to change the baud rate, click on the Baud button and double-click on the desired baud rate.

  Available rates are 9600, 19200, 38400, and 115200. The default is 9600.

  Click *OK* and proceed to step **4**.

- **If you selected *IP [LAN]***, click *OK* and proceed to step **3**.

- **If you selected *Emulate***, click *OK* and see *Using emulation mode* on page 5-19.

3. **If you selected IP [LAN] in step 2**, the IP Connection window appears (figure 5-2).

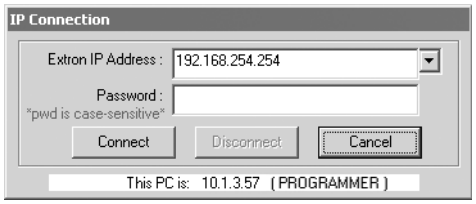


Figure 5-2 — Address and password entry

a. Examine the Extron IP Address field in the IP Connection window. The field displays the last Extron IP address entered.

If the IP address is correct: Proceed to step **3b**.

If the address is not correct: Either click in the Extron IP Address field and enter the IP address or click on the scroll down button (▾) and select from among the recently used addresses. Proceed to step **3b**.

NOTE *If the local system administrators have not changed the value, the factory-specified default, 192.168.254.254, is the correct value for this field.*

b. If the switcher is password protected, click in the Password field and enter the enter the appropriate administrator or user password.

c. Click *Connect*.

If you logged on using the administrator password, the Windows program connects you to the MVX Plus 128 switcher with all of the administrator rights and privileges.

If you logged on using the user password, the Windows program connects you to the MVX Plus 128 switcher with only user capabilities.

If an incorrect password was entered, the program beeps and returns to the password entry display.

4. The Extron Matrix Switcher+ Control Program window (figure 5-3 and figure 5-4) appears. The window displays the current configuration of the attached matrix.

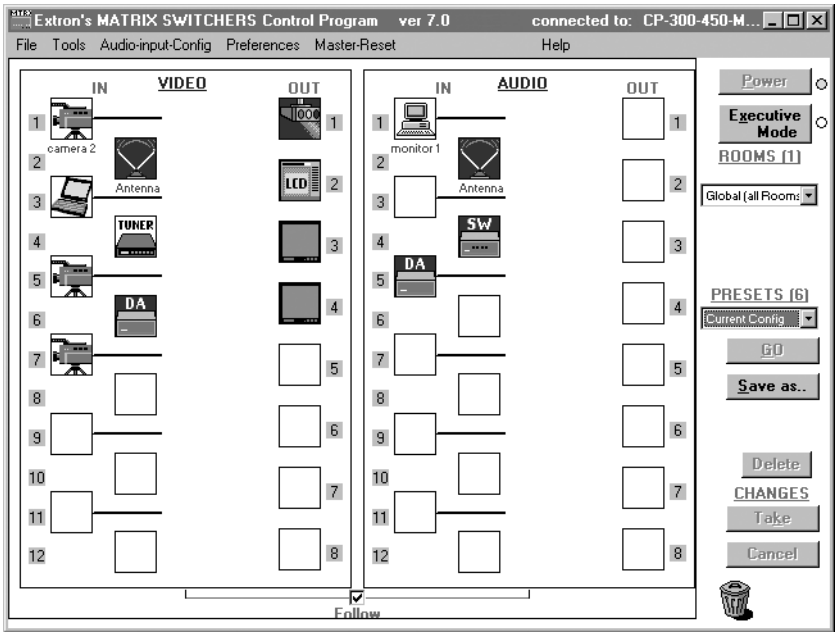


Figure 5-3 — Extron Matrix Switcher+ Control Program window (blank)

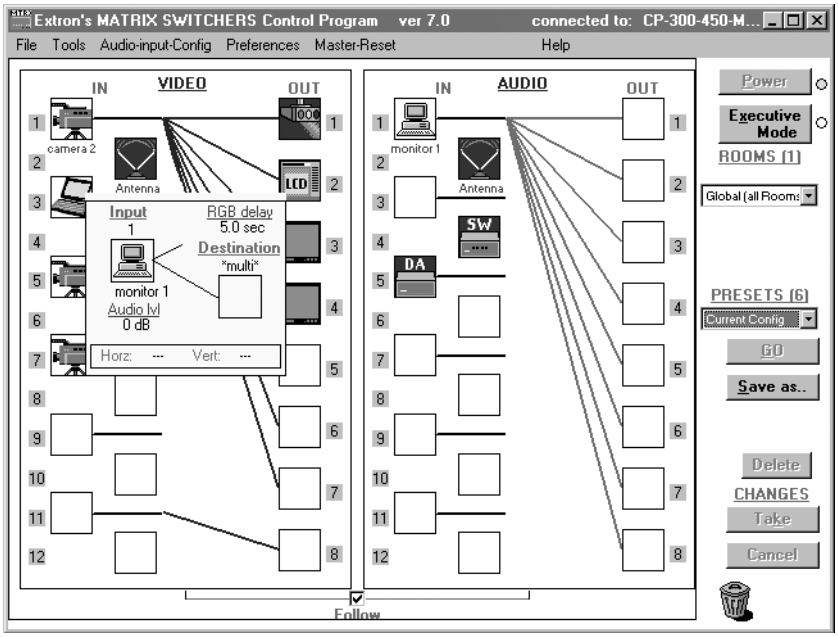


Figure 5-4 — Sample program window (complete)

- To set up audio in follow mode (audio and video have the same tie configuration), select the Follow box at the bottom of the window. To set up audio in breakaway mode (audio and video have different tie configurations), deselect the Follow box.
- To make the control program easier to use, assign a device icon to each input and output. Click on a box that represents an input or output, and drag the desired icon onto the box from the icon palette that appears.
- To create a tie, drag an input box to one or more output boxes. To remove a tie, drag the output box to its tied input box or to the trash can.
- For quick display of information on a specific input or output device, position the cursor over that device in the control program window. The program opens a window that details the connections to that device, the audio level, the RGB delay, and the frequency of the video signal input from or output to that device. See the inset box in figure 5-4.
- If desired, on the task bar, click on *Tools* > *IP Options* to set the switcher's IP parameters in the IP Settings/Options window (figure 5-5).

IP Settings/Options window

The IP Settings/Options window (figure 5-5) provides a location for viewing and, if connected via the RS-232/RS-422 link or if you are logged on via the Ethernet port as an administrator, editing settings unique to the Ethernet interface. See appendix A, *Ethernet Connection*, for basic information about IP addresses. You cannot edit any of the fields on this screen while you are logged on as a user.

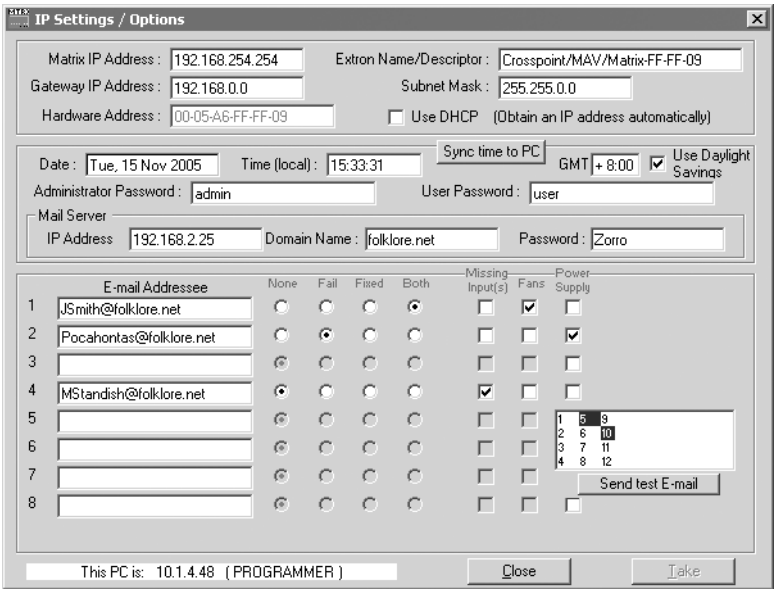


Figure 5-5 — Control program IP setting/options window

NOTE *Editing variables on the IP Settings/Options screen while connected via the Ethernet port can immediately disconnect the user from the switcher. Extron recommends editing the settings on this screen using the RS-232 link and protecting the Ethernet access to this screen by assigning an administrator's password to qualified and knowledgeable personnel only.*

NOTE *When the control program is connected to the switcher via the RS-232 link, the Administrator and User Password fields are not masked. If a password has been inadvertently changed to an unknown value, you can look up and, if desired, change a password in this window without knowing the current password.*

Matrix IP Address field

The Matrix IP Address field contains the IP address of the connected matrix switcher. This value is encoded in the flash memory in the switcher.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields, properly called octets, separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeroes, up to 3 digits total per field, are optional. Values of 256 and above are invalid.

The default address is 192.168.254.254, but if this conflicts with other equipment at your installation, you can change the IP address to any valid value.

NOTE *Editing the Extron IP address while connected via the Ethernet port can immediately disconnect the user from the matrix switcher. Extron recommends editing this field using the RS-232/RS-422 link and protecting the Ethernet access to this screen by assigning an administrator's password to qualified and knowledgeable personnel only.*

Edit this field as follows:

1. Click in the Matrix IP address field. The graphic cursor becomes a text cursor.
2. Edit the address as desired.
3. Press the Tab key on the keyboard or click in another field to exit the Matrix IP Address field.
4. Click the *Take* button to make the address change take affect.

Extron Name/Descriptor field

The Extron Name/Descriptor field contains the name used as the "from" information when the MVX Plus 128 switcher e-mails notification of its failed or repaired status. This descriptor can be changed to any valid name, up to 12 alphanumeric characters.

NOTE *The following characters are invalid in the Extron Name/Descriptor field: {space} + ~ , @ = ‘ [ ] { } < > ’ “ ; : | \ and ?.*

Edit this field as follows:

1. Click in the Extron name/descriptor field. The graphic cursor becomes a text cursor.
2. Edit the name as desired.
3. Press the Tab key on the keyboard or click in another field to exit the Extron Name/Descriptor field.
4. Click the *Take* button to make the name change take effect.

Gateway IP address field

The Gateway IP Address field identifies the address of the gateway to the mail server to be used if the MVX Plus 128 switcher and the mail server are not on the same subnet.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric octets separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeroes, up to 3 digits total per field, are optional. Values of 256 and above are invalid.

Edit this field as follows:

1. Click in the Gateway IP Address field. The graphic cursor becomes a text cursor.
2. Edit the address as desired.
3. Press the Tab key on the keyboard or click in another field to exit the Gateway IP Address field.
4. Click the *Take* button to make the address change take affect.

Subnet Mask field

The Subnet Mask field is used to determine whether the MVX Plus 128 switcher is on the same subnet as the controlling PC or the mail server when you are subnetting. For more information, see *Subnetting — A Primer*, in Appendix A, *Ethernet Connection*.

Edit this field as follows:

1. Click in the Subnet Mask field. The graphic cursor becomes a text cursor.
2. Edit the mask as desired.
3. Press the Tab key on the keyboard or click in another field to exit the Subnet Mask field.
4. Click the *Take* button to make the mask take affect.

Hardware Address field

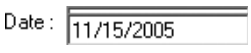
The hardware address is hardcoded in the MVX Plus 128 switcher and cannot be changed.

Use DHCP checkbox

The Use DHCP checkbox directs the MVX Plus 128 switcher to ignore any entered IP addresses and to obtain its IP address from a Dynamic Host Configuration Protocol (DHCP) server (if the network is DHCP capable). Contact the local system administrator.

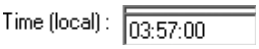
Date field

The Date field displays the current date in the Greenwich Mean Time zone. If necessary, adjust the date as follows:



1. Click in the Date field. A set date field appears with the date in the format (M)M/(D)D/YYYY. Leading zeroes are not used. The graphic cursor becomes a text cursor in the set date field.
2. Edit the field as desired to set the proper date. Leading zeroes are optional.
3. Press the Tab key on the keyboard or click in another field to exit the set date field.
4. Click the *Take* button to make the date change take affect.

Time (local) field



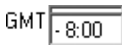
The Time (local) field displays the current time in the local time zone. If necessary, click on the Sync Time to PC button to set the switcher to your computer's internal time or else adjust the time manually as follows:

1. Click in the time field. A set time field appears with the date in the format HH:MM:SS (00:00:00 to 23:59:59). The graphic cursor becomes a text cursor in the set time field.
2. Edit the field as desired to set the proper time. Remember to use 24-hour time. Leading zeroes are optional.
3. Press the Tab key on the keyboard or click in another field to exit the set time field.
4. Click the *Take* button to make the time change take affect.

Sync Time to PC button

Clicking the mouse on the Sync Time to PC button causes the computer you are operating to send its internal time to the switcher in a set time command.

GMT (offset) field



The GMT field displays the amount of time, in hours and minutes, that the local time varies from the GMT international time reference. If necessary, adjust the offset as follows:

1. Click in the GMT field. A set offset field appears with the offset in the format ±HH:MM (–12:00 to +14:00). The graphic cursor becomes a text cursor in the set offset field.
2. Edit the field as desired to set the proper offset. Leading zeroes are optional. Some time zones are on the half-hour (30 minutes).
3. Press the Tab key on the keyboard or click in another field to exit the Set Offset field.
4. Click the *Take* button to make the offset change take affect.

Use Daylight Savings checkbox

Click in the Use Daylight Savings checkbox. When Daylight Savings Time is turned on, the switcher automatically updates its internal clock between Standard Time and Daylight Savings Time in the spring and fall on the date that the time change occurs in the country or region selected. When Daylight Savings Time is turned off, the switcher does not adjust its time reference.

Administrator Password field

The Administrator Password field displays the password required to log on to the MVX Plus 128 switcher via the Ethernet port with all of the administrator's rights and privileges. Passwords are case sensitive and are limited to 12 upper-case and lower-case alphanumeric characters.

While you are logged on as a user, this field is masked with asterisks (**********) as a security measure.

NOTE *Editing the Administrator Password field while connected via the Ethernet port can immediately disconnect the user from the switcher. Extron recommends editing this field using the RS-232/RS-422 link and protecting the Ethernet access to this screen by assigning an administrator's password to qualified and knowledgeable personnel only.*

NOTE *The following characters are invalid in passwords: {space} + ~ , @ = ' [ ] { } < > ' " ; : | \ and ?.*

Edit this field as follows:

1. Click in the Administrator Password field. The graphic cursor becomes a text cursor.
2. Edit the case-sensitive password as desired.
3. Press the Tab key on the keyboard or click in another field to exit the Administrator Password field.
4. Click the *Take* button to make the password change take affect.

User Password field

The User Password field displays the password required to log on to the MVX Plus 128 switcher via the Ethernet port as a user, without all of the administrator's rights and privileges. Passwords are case sensitive and are limited to 12 upper-case and lower-case alphanumeric characters.

While you are logged on as a user, this field is masked with asterisks (**********) as a security measure.

NOTE *An administrator password must be created before a user password can be created.*

NOTE *The following characters are invalid in passwords: {space} + ~ , @ = ' [ ] { } < > ' " ; : | \ and ?.*

Edit this field as follows:

1. Click in the User Password field. The graphic cursor becomes a text cursor.
2. Edit the case-sensitive password as desired.
3. Press the Tab key on the keyboard or click in another field to exit the User Password field.
4. Click the *Take* button to make the password change take affect.

Mail Server IP Address field

The Mail Server IP Address field displays the IP address of the mail server that handles the e-mail for the facility in which the MVX Plus 128 switcher is installed.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric octets separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeroes, up to three digits total per field, are optional. Values of 256 and above are invalid.

Edit this field as follows:

1. Click in the mail server IP address field. The graphic cursor becomes a text cursor.
2. Edit the IP address as desired.
3. Press the Tab key on the keyboard or click in another field to exit the mail server IP address field.
4. Click the *Take* button to make the address change take affect.

Mail Server Domain Name field

The Mail Server Domain Name field displays the domain name that the MVX Plus 128 switcher uses to log on to the e-mail server. Standard domain conventions (such as *nnnnn@xxx*.com) apply.

NOTE *The following characters are invalid in a domain name: {space} + ~ , = ‘ [ ] { } < > ’ “ ; : | \ and ?. The @ character is only acceptable as the lead-in to the domain name (such as @folklore.net).*

Edit this field as follows:

1. Click in the Mail Server Domain Name field. The graphic cursor becomes a text cursor.
2. Edit the name as desired.
3. Press the Tab key on the keyboard or click in another field to exit the Mail Server Domain Name field.
4. Click the *Take* button to make the name change take affect.

Mail Server Password field

The Mail Server Password field displays the password that the MVX Plus 128 switcher uses to log on to the e-mail server. Passwords are case sensitive and are limited to 12 upper-case and lower-case alphanumeric characters.

NOTE *The following characters are invalid in passwords: {space} + ~ , @ = ‘ [ ] { } < > ’ “ ; : | \ and ?.*

Edit this field as follows:

1. Click in the Mail Server Password field. The graphic cursor becomes a text cursor.
2. Edit the case-sensitive password as desired.
3. Press the Tab key on the keyboard or click in another field to exit the Mail Server Password field.
4. Click the *Take* button to make the password change take affect.

E-mail Addressee fields

The eight E-mail Addressee fields permit the administrator to identify the e-mail addresses of the personnel to whom the MVX Plus 128 switcher e-mails notification of its failure and repair status. Figure 5-6 shows a typical e-mail from the switcher.

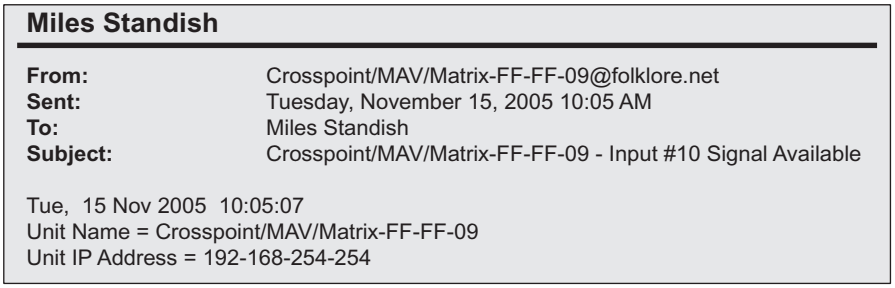

Miles Standish
From: Crosspoint/MAV/Matrix-FF-FF-09@folklore.net
Sent: Tuesday, November 15, 2005 10:05 AM
To: Miles Standish
Subject: Crosspoint/MAV/Matrix-FF-FF-09 - Input #10 Signal Available
Tue, 15 Nov 2005 10:05:07
Unit Name = Crosspoint/MAV/Matrix-FF-FF-09
Unit IP Address = 192-168-254-254

Figure 5-6 — Typical MVX Plus 128 e-mail

The radio buttons and check boxes associated with each address field permit the administrator to specify specific e-mail requirements for each recipient.

Edit these fields and controls as follows:

1. Click in the desired E-mail Addressee field. The graphic cursor becomes a text cursor.
2. Edit the e-mail address as desired. Standard e-mail address conventions (for example: *nnnnn@xxx*.com) apply.
3. Press the Tab key on the keyboard or click in another field to exit the e-mail addressee field.
4. In the square check boxes associated with each addressee, select the options about which the addressee is to be e-mailed: missing input(s), fans, and/or power supply. In the floating box that contains the input numbers, select the inputs that need monitoring.
5. In the round radio buttons associated with each addressee, select whether the addressee is to be e-mailed of failures, fixes, both, or not be notified. The None radio button is useful for temporarily removing personnel from the e-mail list when they are unavailable, such as on travel or vacation.
6. If desired, click on the *Send test E-mail* button to test the e-mail function.
7. Click the *Take* button to make the e-mail address changes take affect.

Updating firmware

The firmware upgrade utility provides a way to replace the firmware that is coded on the switcher's control board without taking the switcher out of service, opening the switcher enclosure, and replacing the firmware chip.

Update the switcher firmware as follows:

NOTE *The update firmware utility is for replacing the firmware that controls all switcher operation. This is* ***not*** *the page to insert your own HTML pages. See* Uploading HTML files*, later in this chapter, to insert custom HTML pages.*

1. Visit the Extron web site, www.extron.com, select the CrossPoint/MAV Plus product category, and select the latest firmware install package (*.exe file) for download. Note the folder to which you save the firmware file.
2. Run the executable (*.exe) file to decompress the firmware file.
3. Start the Matrix Switcher+ Control Program and connect to the MVX Plus 128 switcher. See *Using the software* in this chapter, steps **1** through **4**, starting on page 5-3.

NOTE *The Ethernet connection is much faster than the RS-232/RS-422 connection. Extron recommends using the Ethernet connection rather than the serial port for firmware uploads.*

4. Click *Tools* > *Update firmware*. The open file window appears (figure 5-7).

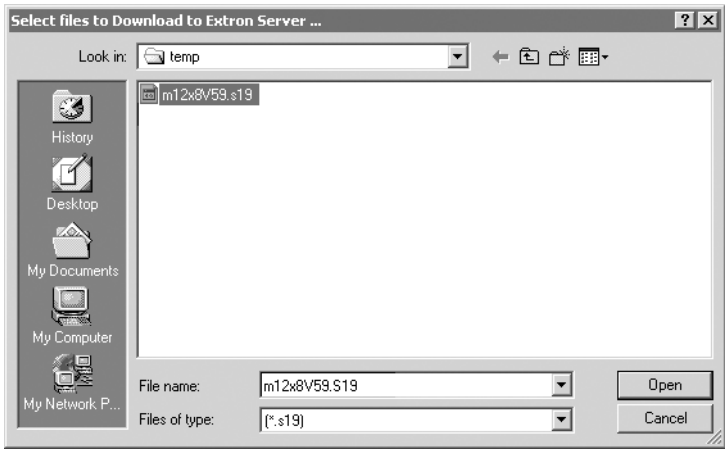


Figure 5-7 — Open file window

5. Navigate to the folder where you saved the firmware upgrade file. Select the file.

NOTE *Valid firmware files must have the file extension .S19. Any other file extension is not a firmware upgrade.*

NOTE *The original factory-installed firmware is permanently available on the MVX Plus 128 switcher. If the attempted firmware upload fails for any reason, the switcher reverts to the factory-installed firmware.*

6. Click the *Open* button. A status window, which shows the progress of the upload, appears. The firmware upload to the MVX Plus 128 switcher may take a few minutes.

Uploading HTML files

You can create customized HTML pages for the switcher to display. The HTML Files List window (figure 5-8) provides a way to view the contents of the switcher's file system and to upload custom HTML pages to the switcher.

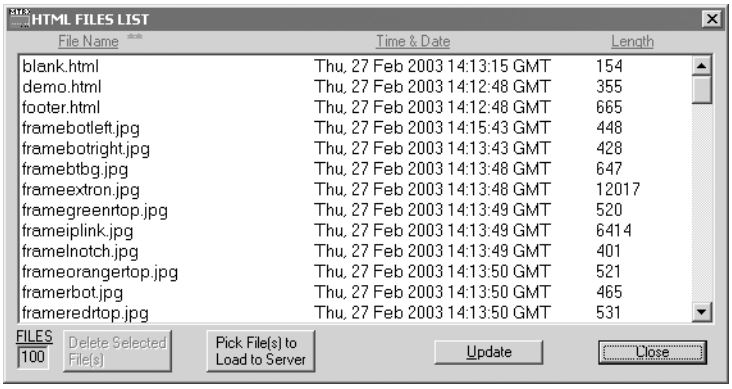

HTML FILES LIST
File Name
Time & Date
Length
blank.html Thu, 27 Feb 2003 14:13:15 GMT 154
demo.html Thu, 27 Feb 2003 14:12:48 GMT 355
footer.html Thu, 27 Feb 2003 14:12:48 GMT 665
framebotleft.jpg Thu, 27 Feb 2003 14:15:43 GMT 448
framebotright.jpg Thu, 27 Feb 2003 14:13:43 GMT 428
framebtbg.jpg Thu, 27 Feb 2003 14:13:48 GMT 647
frameextron.jpg Thu, 27 Feb 2003 14:13:48 GMT 12017
framegreenrtop.jpg Thu, 27 Feb 2003 14:13:49 GMT 520
frameiplink.jpg Thu, 27 Feb 2003 14:13:49 GMT 6414
framelnotch.jpg Thu, 27 Feb 2003 14:13:49 GMT 401
frameorangertop.jpg Thu, 27 Feb 2003 14:13:50 GMT 521
framerbot.jpg Thu, 27 Feb 2003 14:13:50 GMT 465
frameredrtop.jpg Thu, 27 Feb 2003 14:13:50 GMT 531
FILES
100
Delete Selected File(s)
Pick File(s) to Load to Server
Update
Close

Figure 5-8 — HTML Files List window

Upload HTML pages as follows:

NOTE *The files listed in figure 5-8 are shown for example only and may not be present on your switcher.*

NOTE *The HTML Files List window is for inserting your own HTML pages. This is* ***not*** *the window to repl*ace the firmware that controls all switcher operation. See *Updating firmware, earlier in this chapter, to replace the firmware.*

NOTE *The following characters are invalid in file names:*
{space} + ~ , @ = ' [ ] { } < > ' " ; : | \ and ?.

1. Connect the PC to the MVX Plus 128 switcher via the switcher's RS-232/RS-422 port or Ethernet port.
2. Start the Matrix Switcher+ Control Program and connect to the MVX Plus 128 switcher. See *Using the software* in this chapter, steps **1** through **4**, starting on page 5-3.
3. Click on *Tools > HTML File Manager*.
4. Click the *Pick File(s) to Load to Server* button. An open file window appears.
5. Navigate to the folder where you saved the HTML file(s). Select the file(s).

NOTE *To select multiple files, hold the Ctrl key while you select the desired files.*

NOTE *If you want one of the HTML files that you created to be the default start-up page, name the file "index.html". The MVX Plus 128 switcher looks for that file name when you first connect to it using an Internet browser.*

6. Click the *Open* button. The file(s) upload to the MVX Plus 128 switcher may take a few minutes.
7. Click the *Update* button to confirm the upload.
8. Click the *Close* button to exit the HTML Files List window.

Windows buttons, drop boxes, and trashcan

The buttons, drop boxes, and trash can on the right side of the program window perform the following functions:

Power — Unavailable for MVX Plus 128 switchers, because the switcher power cannot be controlled via software.

Executive mode — Allows you to lock out front panel operations, except for the view-only mode functions.

Room menu — Displays a list of up to 10 rooms. You can select a room from the list to display it in the window.

NOTE *A **Room** is a subset of outputs that are logically related to each other, as determined by the operator. The MVX Plus 128 switcher supports up to 10 **rooms**, each of which can consist of from 1 to 16 outputs.*

Presets menu — Displays a list of up to 32 global presets and up to 100 room presets (10 rooms x 10 presets per room). You can select a preset from the list to display it in the window and either activate it (**Go**) or delete it (**Delete**).

Go — Activates the selected preset as the current configuration.

Save as — Allows the current set of ties to be saved as a preset. Enter the preset number when prompted to do so.

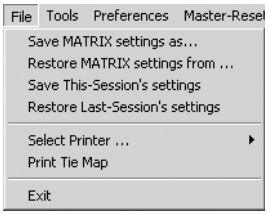
Changes – Take — Allows you to save to file any changes made to the displayed configuration.

Changes – Cancel — Returns to the previous screen, undoing any changes you have made.

Trash can — Drag and drop from an input or output button to the trash can to unmake all ties associated with that input or output.

Windows menus

File menu



Save matrix settings as — Saves a complete set of up to 32 presets, plus the last active setting (preset #0), to a file. Saved settings include audio gain settings (if specified), assigned icons, and icon captions.

Restore matrix settings from — Loads and activates a previously saved setting file.

Save this-session's settings — Saves the current assigned icons and icon captions.

Restore last-session's settings — Loads the icons and icon captions that were saved during the last session. If you saved the previous session's changes to disk the last time you exited the program, the ties from that session are also loaded.

Select printer — Selects the target printer.

Print tie map — Prints the tie set that is displayed on the screen.

Exit — Closes the Matrix Switcher+ Control Program.

Tools menu

Assign device icons — Displays the complete set of input and output device icons. You can drag any of these icons to the input and output boxes.

Edit device palette — Allows you to add your own device icon graphics.

RGB delay settings — Displays the switching interval setting for each input and allows you to change them.

Audio-Input gain settings — Displays the audio gain level setting for a single input or for all inputs and allows you to change it. The level is expressed as the magnitude (number of decibels) and polarity (positive, gain or negative, attenuation) of the audio adjustment.

Audio-Output volume settings — Displays the audio output level setting for a single input or for all inputs and allows you to change it. The level is expressed as a percentage of the input audio volume that is applied to the output; 0% is full attenuation (audio is silent), 100% is full volume.

View input frequencies — (DSVP) Displays the input horizontal and vertical frequencies for each input.

Update firmware — Allows you to replace the firmware that is coded on the switcher's control board without taking the switcher out of service, opening the switcher enclosure, and replacing the firmware chip set. See *Updating firmware* on page 5-13.

IP options — Allows you to set IP options. See *IP Settings/Options window* on page 5-6.

HTML file manager — Displays a list of HTML files installed on the switcher and allows you to upload custom files from a connected PC to the switcher. See *Uploading HTML files* on page 5-14.

Hardware status — Provides an overall view of the status of the matrix switcher, including the power supply voltages, the temperature status, the Remote RS-232/RS-422 port configuration, and the installed and updated firmware status (figure 5-9).

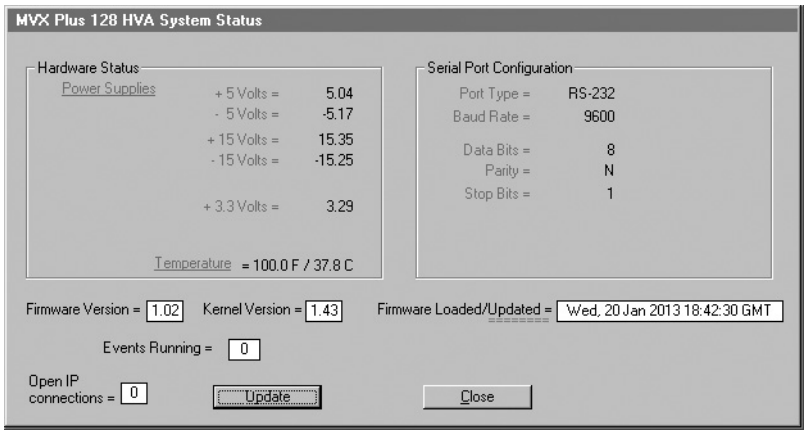

MVX Plus 128 HVA System Status
Hardware Status
Power Supplies
+ 5 Volts = 5.04
- 5 Volts = -5.17
+ 15 Volts = 15.35
- 15 Volts = -15.25
+ 3.3 Volts = 3.29
Temperature = 100.0 F / 37.8 C
Serial Port Configuration
Port Type = RS-232
Baud Rate = 9600
Data Bits = 8
Parity = N
Stop Bits = 1
Firmware Version = 1.02
Kernel Version = 1.43
Firmware Loaded/Updated = Wed, 20 Jan 2013 18:42:30 GMT
Events Running = 0
Open IP connections = 0
Update
Close

Figure 5-9 — Status window

Name presets — Allows you to assign a name to each of the 32 memory presets.

NOTE *Preset names are limited to 12 upper- and lower-case alphanumeric characters, space, and the _ : = and / characters.*

NOTE *The following characters are invalid in preset names:* + ~ , @ = ‘ [ ] { } < > ’ “ ; : | \ *and ?.*

Show RS-232 strings — Displays the ASCII commands that are used by the current configuration. You can refer to these for RS-232 programming.

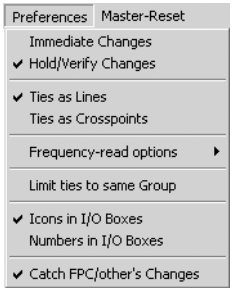
I/O group settings — Allows you to establish I/O groups.

Room configuration — Allows you to assign outputs to rooms or delete outputs from rooms.

NOTE *A **Room** is a subset of outputs that are logically related to each other, as determined by the operator. The MVX Plus 128 switcher supports up to 10 **rooms**, each of which can consist of from 1 to 16 outputs.*

Initialize — Initializes and clears any or all of the following: ties, presets, audio configuration, preset names, icon names, and icons.

Preferences menu



Immediate changes — Causes configuration changes to take effect immediately.

Hold/verify changes — Delays implementation of configuration changes until the Changes – Take button is pressed.

Ties as lines — Displays ties as lines (figure 5-10).

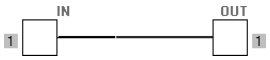


Figure 5-10 — Ties shown as lines

Ties as crosspoints — Displays ties as a matrix of inputs and outputs (figure 5-11). Ties that have been made are indicated as **amber** (video and audio), **green** (video only), and **red** (audio only) boxes. Ties that will take effect when you click on the *Take* button are indicated by +. Ties that will be broken when you click on the *Take* button are indicated by –.

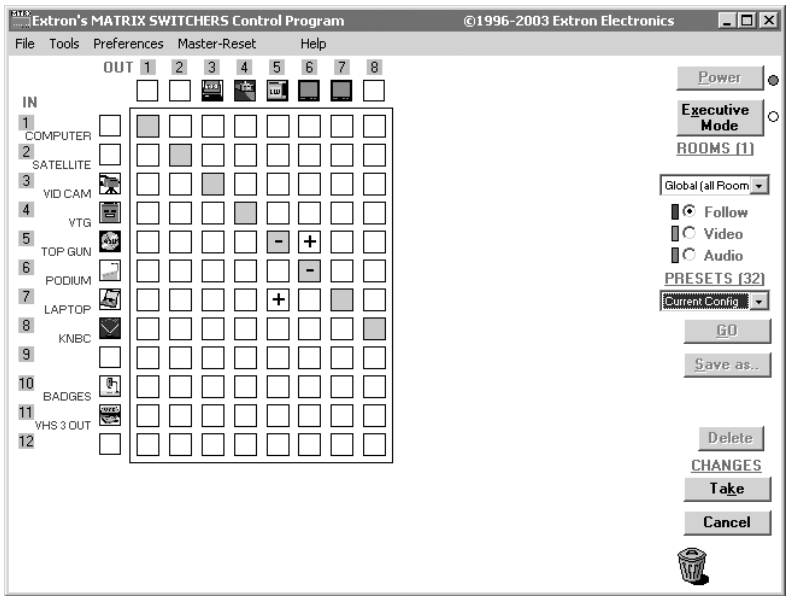


Figure 5-11 — Ties shown as crosspoints

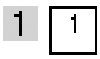
Frequency read options — Allows you to set the input signal detection (DSVP) feature as follows:

- To never sample and display the sync or no sync status (set this option to **None**).
- To automatically refresh the display (set this option to **Automatically every 10 seconds**).
- To sample the sync and update the display whenever you make a configuration change (set this option to **On demand or by refresh**).

Limit ties to same group — Allows you to limit the creation of ties using the program to inputs and outputs that are in the same group (similar to front panel operation).

Icons in I/O boxes — Erases any numbers in the I/O boxes in the Control Program window (figure 5-4). You can place icons in the boxes.

Numbers in I/O boxes — Erases any icons in the I/O boxes in the Control Program window and fills each box with the associated input or output number.



Catch FPC/others changes — When checked, sets the switcher to report all configuration and setting changes to the Remote RS-232/RS-422 or Ethernet connection that turned this selection on. These reports allow the Matrix Switcher+ Control Program to track the changes that occur in the switcher's configuration and settings, whether commanded via the front panel, the RS-232/RS-422 port, or the Ethernet port.

Master-Reset selection

Master reset clears all ties and presets, all video and audio mutes, resets all I/O grouping, sets all input audio levels to unity gain (+0 dB), and sets all output volume levels to 100% (0 dB of attenuation).

NOTE *Master reset does not reset the Internet protocol (IP) settings.*

Using emulation mode

Emulation mode allows you to set up the software without attaching the switcher to the computer. To use emulation mode, do the following:

1. Double-click the MATRIX Switchers+ Control Program icon in the Extron Electronics group or folder.
2. Choose Emulate, and click *OK*.
3. Choose an emulation file to open, and click on OK. The file DEMO.MTX provides a sample of a completed matrix setup. Selecting the file NEW.INI or clicking *Cancel* provides a blank setup to get you started.
4. Enter the file name under which you want to save any changes to the file, and click *OK*.
5. Select the number of video boards, audio boards, and matrix model for which you are preparing a configuration, and click *OK*.
6. Continue using the program as described on page 5-6.

Using the help system

For information about program features, you can access the help program in any of the following ways:

- From the Extron Electronics program folder or group, double-click on the MATRIX Switcher+ Help icon (shown at right).
- From within the Matrix Switcher Control Program, click on the Help menu on the main screen.
- From within the Matrix Switcher Control Program, press the F1 key.

Special Characters

The HTML language reserves certain characters for specific functions. The switcher does not accept these characters as part of preset names, the switcher's name, passwords, or locally created file names.

The switcher rejects the following characters:
{space (spaces **are** ok for names)} + ~ , @ = ‘ [ ] { } < > ’ “ semicolon (;) colon (:) | \ and ?.

Button-Label Generator Program

The Button Label Generator software creates labels that you can place in the translucent covers of the input and output pushbuttons. You can create labels with names, alphanumeric characters, or even color bitmaps for easy and intuitive input and output selection. See appendix B, *Specifications, Part Numbers, and Accessories*, for blank labels and procedures for removing and replacing the translucent covers.

The program is contained on the same set of 3.5-inch diskettes as the Matrix Switcher+ Control Program and is installed automatically when you install that program.

By default, the Windows installation goes in either the C:\MTRX50 directory, if installed automatically with the Matrix Switcher+ Control Program, or the C:\BUTTONS directory, if installed as a stand-alone program. The Button-Label Generator icon is placed in the "Extron Electronics" group or folder.

Using the software

1. To run the Button-Label Generator program, double-click on the Button-Label Generator icon (shown at right) in the Extron Electronics group or folder, and click OK when prompted. The Button-Label Generator window appears (figure 5-12).

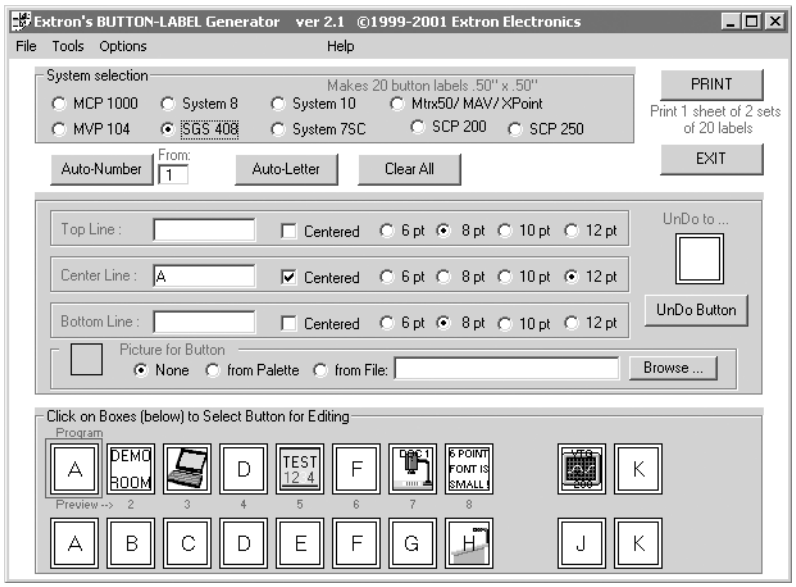

Extron's BUTTON-LABEL Generator ver 2.1 ©1999-2001 Extron Electronics
File Tools Options Help
System selection
Makes 20 button labels .50" x .50"
MCP 1000 System 8 System 10 Mtrx50/ MAV/ XPoint
MVP 104 SGS 408 System 7SC SCP 200 SCP 250
PRINT
Print 1 sheet of 2 sets of 20 labels
EXIT
Auto-Number From: 1 Auto-Letter Clear All
Top Line : Centered 6 pt 8 pt 10 pt 12 pt
Center Line : A Centered 6 pt 8 pt 10 pt 12 pt
Bottom Line : Centered 6 pt 8 pt 10 pt 12 pt
UnDo to ...
UnDo Button
Picture for Button
None from Palette from File: Browse ...
Click on Boxes (below) to Select Button for Editing
Program
Preview -->

Figure 5-12 — Extron's Button-Label Generator window

2. Under System selection, choose *SGS 408* (this selection matches the button size of these MVX Plus 128 switchers).

3. Using normal Windows controls, you can create and print labels that can be placed in the label windows on the front panel of the switcher.

4. Press the *Clear All* button to create new labels as many times as necessary to make all of the button labels that you need.

Access the Help program by clicking on the Help menu. Click the Help menu on the main screen, choose Show Help, and click the *Load Demo* button to see an example of a completed Extron's Button-Label Generator window.

Chapter 6

HTML Operation

Download the Startup Page

System Status Page

System Configuration Page

File Management Page

Set and View Ties Page

Special Characters

HTML Operation

The switcher can be controlled and operated through its Ethernet port, connected via a LAN or WAN, using a web browser such as Microsoft's Internet Explorer. The browser's display of the switcher's status or operation has the appearance of web pages. This chapter describes the factory-installed HTML pages, which are always available and cannot be erased or overwritten.

NOTE *If your Ethernet connection to the matrix switcher is unstable, try turning off the proxy server in your Web browser. In Microsoft's Internet Explore, click Tools > Internet Options > Connections > LAN Settings, uncheck the "Use a proxy server..." box, and then click* OK.

Download the Startup Page

Access the switcher using HTML pages as follows:

1. Start the Web browser program.
2. Click in the browser's Address field.
3. Enter the Matrix IP address in the browser's Address field.

NOTE *If the local system administrators have not changed the value, the factory-specified default, 192.168.254.254, is the correct value for this field.*

4. If you want the browser to display a page other than the default page (such as a custom page that you have uploaded), enter a slash (/) and the file name to open.

NOTE *The browser's Address field should display the address in the following format: xxx.xxx.xxx.xxx/{**optional**_file_name.html}*

NOTE *The following characters are invalid in file names: {space} + ~ , @ = ' [ ] { } < > ' " ; : \| \ and ?.*

5. Press the keyboard Enter key. The switcher checks to see if it is password protected.

   If the switcher is not password protected, it checks and downloads the HTML pages (proceed to step **7)**.

   If the switcher is password protected, the switcher downloads the Enter Network Password page (figure 6-1).

Figure 6-1 — Enter Network Password page

NOTE *A User name entry is not required.*

6. Click in the Password field and type in the appropriate administrator or user password. Click the *OK* button.

7. The switcher checks several possibilities, in the following order, and then responds accordingly:

   a. Does the address include a specific file name, such as 10.13.156.10/file_name.html? **If so**, the switcher downloads that HTML page.

   b. Is there a file in the switcher's memory that is named "index.html"? **If so**, the switcher downloads "index.html" as the default startup page.

   c. **If neither of the above conditions is true**, the switcher downloads the factory-installed default startup page, "nortxe_index.html" (figure 6-2), also known as the System Status page.

System Status Page

The System Status page (figure 6-2) provides an overall view of the status of the matrix switcher, including individual voltages, and the serial port status (if applicable). The System Status page is the default page that the switcher downloads when you connect to the switcher. Access the System Status page from other pages by clicking the *Status* tab.

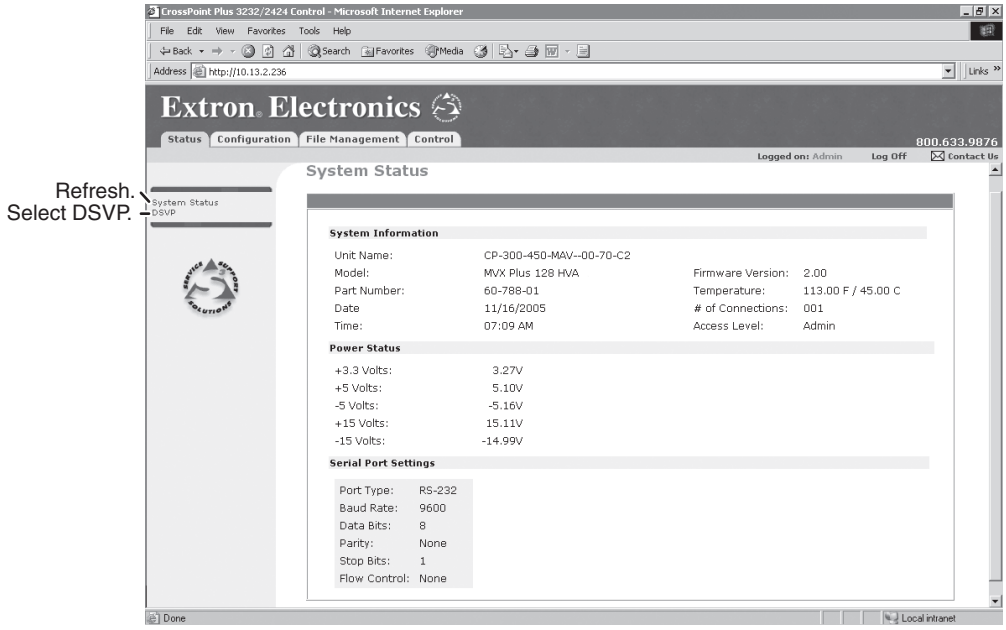


Figure 6-2 — System Status page

The status web page periodically updates itself to reflect the latest status of the switcher components. If a variable changes, the display shows the change in status the next time it updates.

DSVP page

You can view a snapshot-in-time of the input frequencies of connected inputs on the Digital Sync Validation Processing (DSVP) page (figure 6-3). Click the DSVP link to the left of the Status page to download the DSVP page.

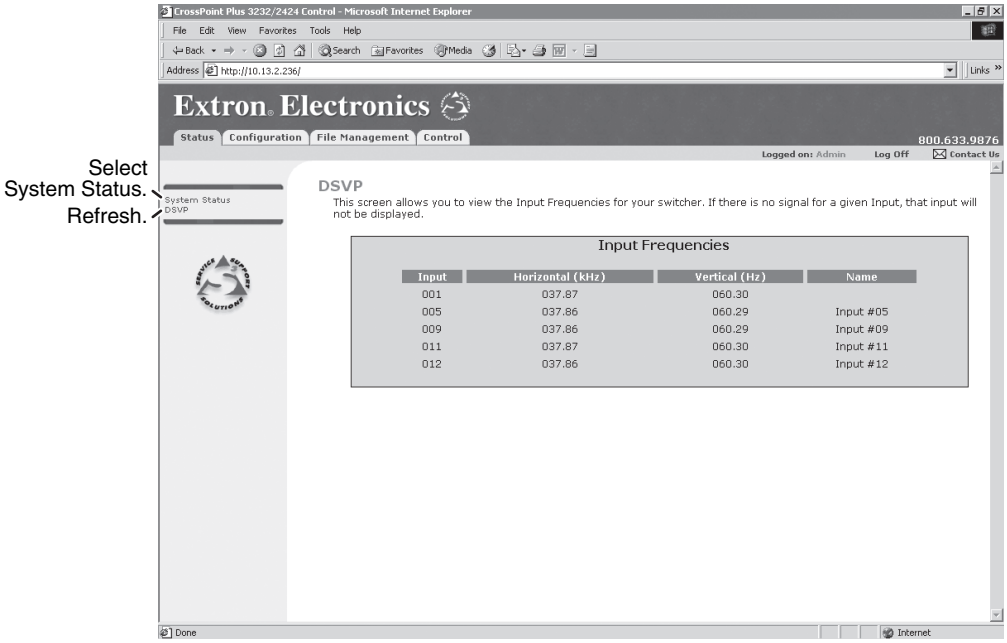

Select
System Status.
Refresh.
CrossPoint Plus 3232/2424 Control - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://10.13.2.236/
Extron Electronics
Status Configuration File Management Control
800.633.9876
Logged on: Admin Log Off Contact Us
System Status
DSVP
DSVP
This screen allows you to view the Input Frequencies for your switcher. If there is no signal for a given Input, that input will not be displayed.
Input Frequencies
Input Horizontal (kHz) Vertical (Hz) Name
001 037.87 060.30
005 037.86 060.29 Input #05
009 037.86 060.29 Input #09
011 037.87 060.30 Input #11
012 037.86 060.30 Input #12
Done
Internet

Figure 6-3 — DSVP page

System Configuration Page

The MVX 128 switcher downloads the System Configuration page (figure 6-4) when you click the *Configuration* tab. The screen consists of fields in which you can view and edit IP administration and system settings. You can access the Email Settings and Passwords pages clicking the appropriate link. See appendix A, *Ethernet Connection*, for basic information about IP addresses and subnetting.

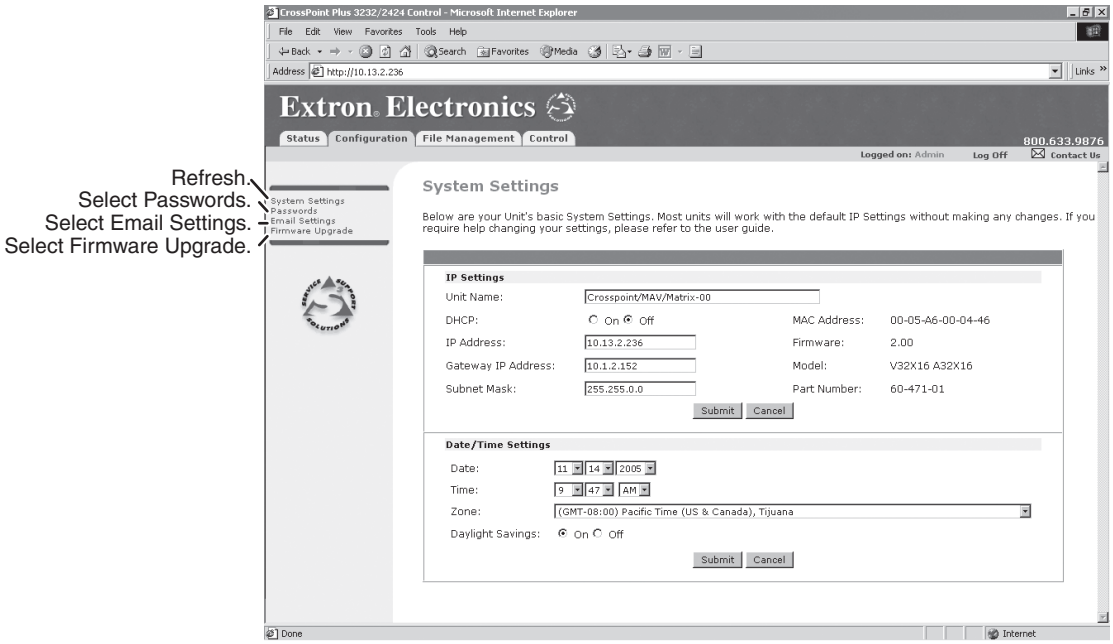


Figure 6-4 — System Configuration page

On password-protected connections, there are two levels of protection: administrator and user. Administrators have full access to all switching capabilities and editing functions. Users can create ties, create and recall presets, set RGB and audio mutes, and view all settings with the exception of passwords.

- Ethernet connection to the switcher, either entering SIS commands (see chapter 4, *Programmer's Guide*) or using the Extron Matrix Switcher Control Program (see chapter 5, *Matrix Software*) **is** password protected.
- Connection via the RS-232/RS-422 port **is not** password protected.

IP Settings fields

The IP Settings fields provide a location for viewing and editing settings unique to the Ethernet interface. After editing any of the settings on this page, click the *Submit* button at the bottom of the page.

Unit Name field

The Unit Name field contains the name used as the "from" information when the switcher e-mails notification of its failed or repaired status. This name field can be changed to any valid name, up to 24 alphanumeric characters.

NOTE *The following characters are invalid in the matrix name: + ~ , @ = ' [ ] { } < > ' " ; : | \ and ?.*

DHCP radio buttons

The DHCP On radio button directs the switcher to ignore any entered IP addresses and to obtain its IP address from a Dynamic Host Configuration Protocol (DHCP) server (if the network is DHCP capable). The DHCP Off radio button turns DHCP off. Contact the local system administrator.

IP Address field

The IP Address field contains the IP address of the connected switcher. This value is encoded in the switcher's flash memory.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric octets separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeroes, up to 3 digits total per field, are optional. Values of 256 and above are invalid.

The factory-installed default address is 192.168.254.254, but if this conflicts with other equipment at your installation, you can change the IP address to any valid value.

NOTE *IP address changes can cause conflicts with other equipment. Only local system administrators should change IP addresses.*

Gateway IP Address field

The Gateway IP Address field identifies the address of the gateway to the mail server to be used if the switcher and the mail server are not on the same subnet.

The gateway IP address has the same validity rules as the system IP address.

Subnet Mask field

The Subnet Mask field is used to determine whether the switcher is on the same subnet as the mail server when you are subnetting. For more information, see *Subnetting — A Primer*, in Appendix A, *Ethernet Connection*.

MAC Address field

The Media Access Control (MAC) Address is hardcoded in the switcher and cannot be changed.

Date/Time Settings fields

The Date/Time Settings fields (figure 6-5) provide a location for viewing and setting the time functions.

Figure 6-5 — Date/Time Settings fields

Change the date and time settings as follows:

1. Click the desired variable's drop box. The adjustable variables are month, day, year, hours, minutes, AM/PM, and (time) zone. A drop-down scroll box appears (the year drop box is selected in figure 6-5).
2. Click and drag the slider or click the scroll up button or the scroll down button until the desired variable is visible.
3. Click the desired variable.

NOTE *If setting the time, set the local time. The Zone variable allows you to then enter the offset from Greenwich Mean Time (GMT).*

NOTE *The Zone field identifies the standard time zone selected and displays the amount of time, in hours and minutes, that the local time varies from the GMT international time reference.*

4. Repeat steps **1** through **3** for other variables that need to be changed.
5. If appropriate, select the Daylight Savings radio button to turn on the daylight savings time feature.

NOTE *When Daylight Savings Time is turned on, the switcher automatically updates its internal clock between Standard Time and Daylight Savings Time in the spring and fall on the date that the time change occurs in the country or region selected. When Daylight Savings Time is turned off, the switcher does not adjust its time reference.*

6. Click the *Submit* button.

Passwords page

Access the Passwords page (figure 6-6) by clicking the Passwords link on the System Settings page.

Select System Settings.
Select Email Settings.
Select Firmware Upgrade.
CrossPoint Plus IP Default Web Page - Microsoft Internet Explorer
Extron Electronics
Status
Configuration
File Management
Control
800.633.9876
Logged on: Admin
Log Off
Contact Us
System Settings
Passwords
Email Settings
Firmware Upgrade
Passwords
To update the Administration Password, enter the desired password, repeat the entry, and press 'Submit'. To update the User Password, enter the desired password, repeat the entry, and press 'Submit'. To clear a password, enter a single space, repeat the entry, and press 'Submit'. Minimum password length is 4 characters. Maximum password length is 12 characters.
Passwords
Administrator Password:
Re-enter Admin Password:
User Password:
Re-enter User Password:
Submit
Cancel

Figure 6-6 — Passwords page

The fields on the Passwords page are for entering and verifying administrator and user passwords. Passwords are case sensitive and are limited to 12 upper-case and lower-case alphanumeric characters. Each password must be entered twice; once in the Password field and then again in the Re-enter Password field. Characters in these fields are masked by asterisks (*****). If you do not want to password protect an access level, leave the Password field and the Re-Enter password field blank. After entering the desired password in both fields, click the *Submit* button.

NOTE *An administrator password must be created before a user password can be created.*

To clear an existing password so that no password is required, delete the asterisks in the Password and Re-enter Password fields and click the *Submit* button.

Email Settings page

Reach the Email Settings page (figure 6-7) by clicking the Email Settings link on the System Configuration page. The Email Settings page has fields for setting up the switcher's e-mail notification capabilities. For the e-mail settings and for each row of the e-mail notification settings, click the *Edit* button to make the fields available for editing. The button changes to *Save*. After editing the settings associated with the *Edit*/*Save* button, click the *Save* button.

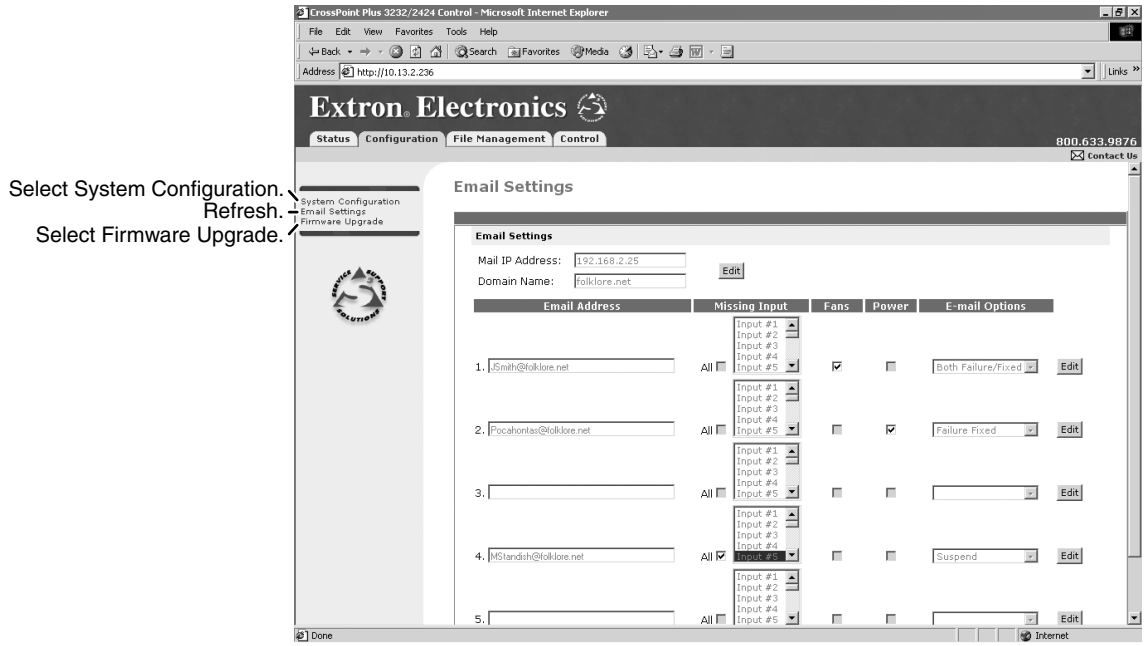


Figure 6-7 — Email Settings page

Mail IP Address field

The Mail IP Address field displays the IP address and the domain name of the mail server that handles the e-mail for the facility in which the MVX 128 switcher is installed.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric octets separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeroes, up to three digits total per field, are optional. Values of 256 and above are invalid.

Domain Name field

The Domain Name field displays the domain name that the MVX 128 switcher uses to log on to the e-mail server. Standard domain name conventions (for example: *nnnnn*@*xxx*.com) apply.

NOTE *The following characters are invalid in a domain name: {space} + ~ , = ' [ ] { } < > ' " ; : | \ and ?. The @ character is acceptable only as the lead-in to the domain name (such as @folklore.net).*

Email address fields

The eight Email address fields identify the e-mail addresses of the personnel to whom the MVX 128 switcher e-mails notification of its failure and repair status. Standard e-mail address conventions (*nnnnn@xxx*.com) apply.

The check boxes and drop boxes associated with each address field permit the operator to specify specific criteria under which the switcher will e-mail recipients. In the associated Missing Input drop boxes, select the inputs to monitor for presence or absence of a signal. Check the Fans and Power boxes to monitor the cooling and power supplies. In the associated E-Mail Options drop box, select whether the recipient is to be e-mailed of failures, fixes, both, not notified, or to be removed from the e-mail list. The Suspend option is useful for temporarily removing personnel from the e-mail list when they are unavailable, such as on travel or vacation. Deleting an e-mail addressee and clicking the submit button removes the recipient from e-mail notification completely.

Firmware Upgrade page

The Firmware Upgrade page provides a way to replace the firmware that is coded on the switcher's control board without taking the switcher out of service, opening the switcher enclosure, and replacing the firmware chip. Access the Firmware Upgrade page (figure 6-8) by clicking the Firmware Upgrade link on the System Configuration page.

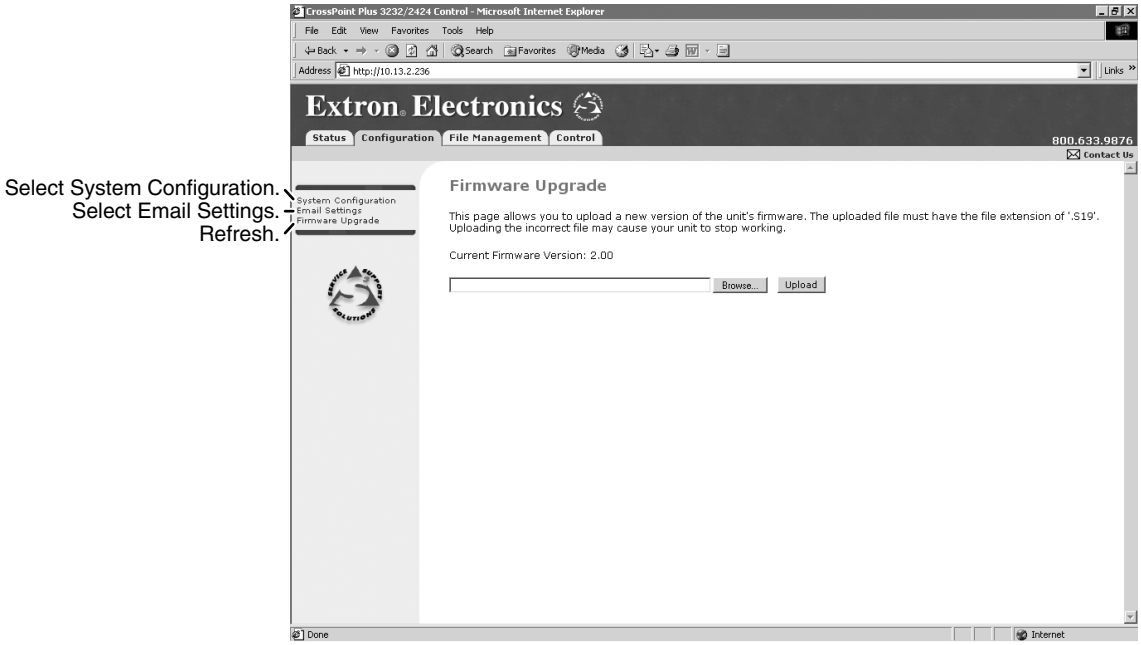

Select System Configuration.
Select Email Settings.
Refresh.
CrossPoint Plus 3232/2424 Control - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://10.13.2.236
Extron Electronics
Status Configuration File Management Control
800.633.9876
Contact Us
System Configuration
Email Settings
Firmware Upgrade
Firmware Upgrade
This page allows you to upload a new version of the unit's firmware. The uploaded file must have the file extension of '.S19'. Uploading the incorrect file may cause your unit to stop working.
Current Firmware Version: 2.00
Browse...
Upload
Done
Internet

Figure 6-8 — Firmware Upgrade page

Update the switcher firmware as follows:

NOTE *The Firmware Upgrade page is **only** for replacing the firmware that controls all switcher operation. To insert your own HTML pages, see* File Management Page, *on page 6-11.*

1. Visit the Extron web site, www.extron.com, select the CrossPoint/MAV Plus product category, select the latest firmware installation package (*.exe file) for the switcher, and download the file. Note the folder to which you save the firmware file.

2. Run the executable (*.exe) file to decompress the firmware file.
3. Connect the PC to the MVX 128 switcher via the switcher's Ethernet port.
4. Access the MVX 128 switcher using HTML pages.
5. Click the Configuration tab.
6. Click the Firmware Upgrade link.
7. Click the *Browse* button. An open file window appears.
8. Navigate to the folder where you saved the firmware upgrade file. Select the file.

NOTE *Valid firmware files must have the file extension ".S19". Any other file extension is **not** a firmware upgrade.*

NOTE *The original factory-installed firmware is permanently available on the MVX 128 switcher. If the attempted firmware upload fails for any reason, the switcher automatically reverts to the factory-installed firmware.*

9. Click the *Open* button.
10. Click the *Upload* button. The firmware upload to the MVX 128 switcher may take a few minutes.

File Management Page

To delete files such as HTML pages from the switcher or to upload your own files to the switcher, click the File Management tab. The switcher downloads the file management HTML page (figure 6-9).

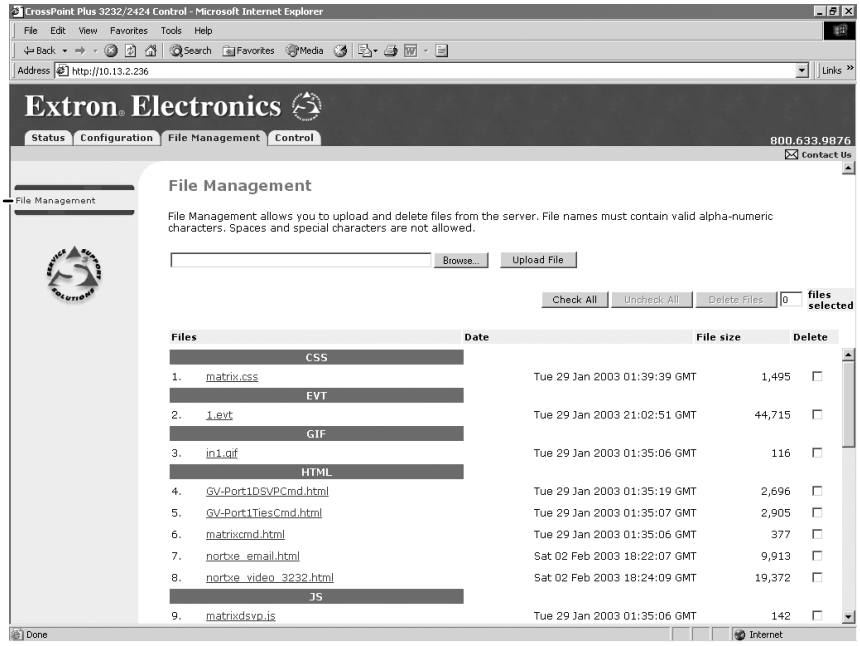

Refresh.
CrossPoint Plus 3232/2424 Control - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://10.13.2.236
Extron Electronics
Status
Configuration
File Management
Control
800.633.9876
Contact Us
File Management
File Management
File Management allows you to upload and delete files from the server. File names must contain valid alpha-numeric characters. Spaces and special characters are not allowed.
Browse...
Upload File
Check All
Uncheck All
Delete Files
files selected
Files
Date
File size
Delete
CSS
1. matrix.css Tue 29 Jan 2003 01:39:39 GMT 1,495
EVT
2. 1.evt Tue 29 Jan 2003 21:02:51 GMT 44,715
GIF
3. in1.gif Tue 29 Jan 2003 01:35:06 GMT 116
HTML
4. GV-Port1DSVPCmd.html Tue 29 Jan 2003 01:35:19 GMT 2,696
5. GV-Port1TiesCmd.html Tue 29 Jan 2003 01:35:07 GMT 2,905
6. matrixcmd.html Tue 29 Jan 2003 01:35:06 GMT 377
7. nortxe_email.html Sat 02 Feb 2003 18:22:07 GMT 9,913
8. nortxe_video_3232.html Sat 02 Feb 2003 18:24:09 GMT 19,372
JS
9. matrixdsvp.js Tue 29 Jan 2003 01:35:06 GMT 142
Done
Internet

Figure 6-9 — File Management page

NOTE *The files listed in figure 6-9 are shown for example only and may not be present on your switcher.*

To delete a file, check the associated delete check box and click the *Delete Files* button.

Upload your own files as follows:

NOTE *The following characters are invalid in file names: {space} + ~ , @ = ' [ ] { } < > ' " ; : \| \ and ?.*

1. Click the *Browse* button.
2. Browse through your system and select the desired file(s).

NOTE *If you want one of the pages that you create and upload to be the default startup page, name that file "index.html".*

3. Click the *Upload File* button. The file(s) that you selected appear in the list.

Set and View Ties Page

You can create ties on the Set and View Ties page (figure 6-10). Access the Set and View Ties page by clicking the *Control* tab.

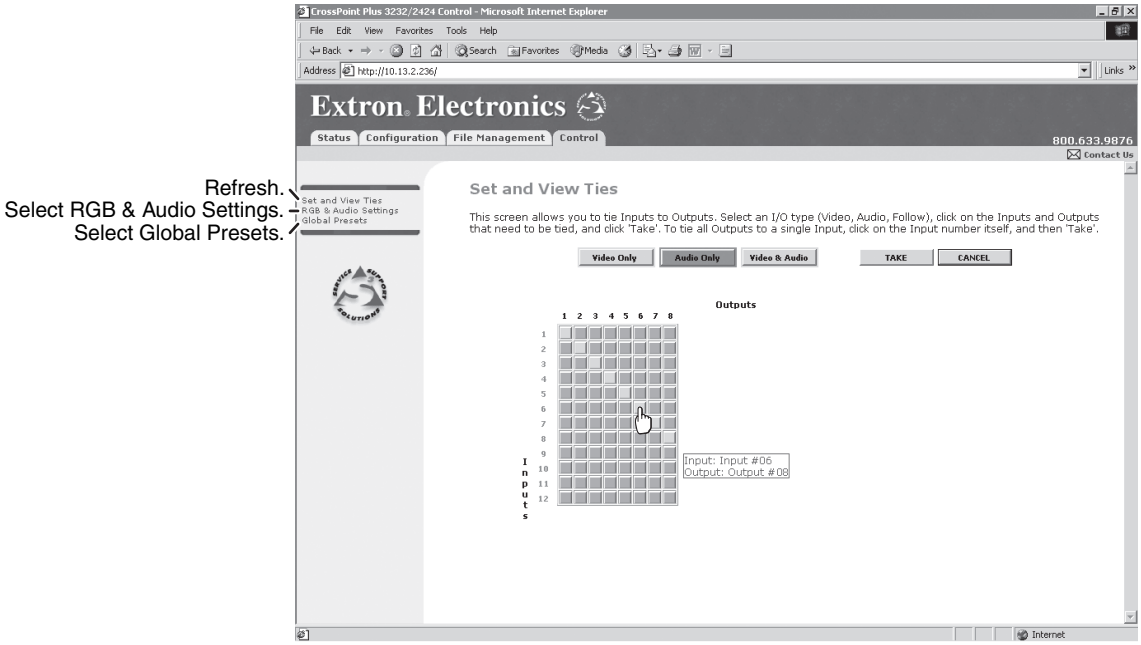

Refresh.
Select RGB & Audio Settings.
Select Global Presets.
CrossPoint Plus 3232/2424 Control - Microsoft Internet Explorer
Extron Electronics
Status
Configuration
File Management
Control
800.633.9876
Contact Us
Set and View Ties
RGB & Audio Settings
Global Presets
Set and View Ties
This screen allows you to tie Inputs to Outputs. Select an I/O type (Video, Audio, Follow), click on the Inputs and Outputs that need to be tied, and click 'Take'. To tie all Outputs to a single Input, click on the Input number itself, and then 'Take'.
Video Only
Audio Only
Video & Audio
TAKE
CANCEL
Outputs
1 2 3 4 5 6 7 8
Inputs
1 2 3 4 5 6 7 8 9 10 11 12
Input: Input #06
Output: Output #08
Internet

Figure 6-10 — Set and View Ties page

The page consists of a matrix of input (rows) and output (columns) selection buttons of four different colors:

- The **amber** buttons indicate **video and audio ties**.
- The **green** buttons indicate **video only ties**.
- The **red** buttons indicate **audio only ties**.
- The **gray** buttons indicate **no ties**.

NOTE *If you lose track of the input and output associated with a specific button, let the mouse pointer rest over a button for a moment. As shown on figure 6-10, a field pops up that identifies the input and output for that button.*

Creating a tie

Select and switch an input as follows:

1. Click the *Video Only, Audio Only*, or *Video & Audio* button to select video, audio, or both for switching (audio follow or audio breakaway). Each mouse click on a button toggles the other two buttons off.
2. Move the mouse over the matrix of input and output selection buttons. Click a button to create a preliminary tie (if a tie exists) or preliminary untie (if a tie exists) of the input and output associated with that button. A "P" (for preliminary) appears in the button.

NOTE *If you lose track of the input and output associated with a specific button, let the mouse rest over one of the tie buttons for a moment. A field pops up (as shown on figure 6-10) that identifies the input and output for that button.*

NOTE *To tie an input to all outputs, click that input's input number.*

3. Click the *Take* button to make the configuration changes or the *Cancel* button to abandon the configuration changes.

RGB and Audio Settings page

The RGB and Audio Settings page provides a way to set the input audio gain and attenuation, set the output volume, mute and unmute all video and audio outputs, and set the RGB delay (switching interval). Access the RGB and Audio Settings page (figure 6-11) by clicking the RGB & Audio Settings link on the Control page.

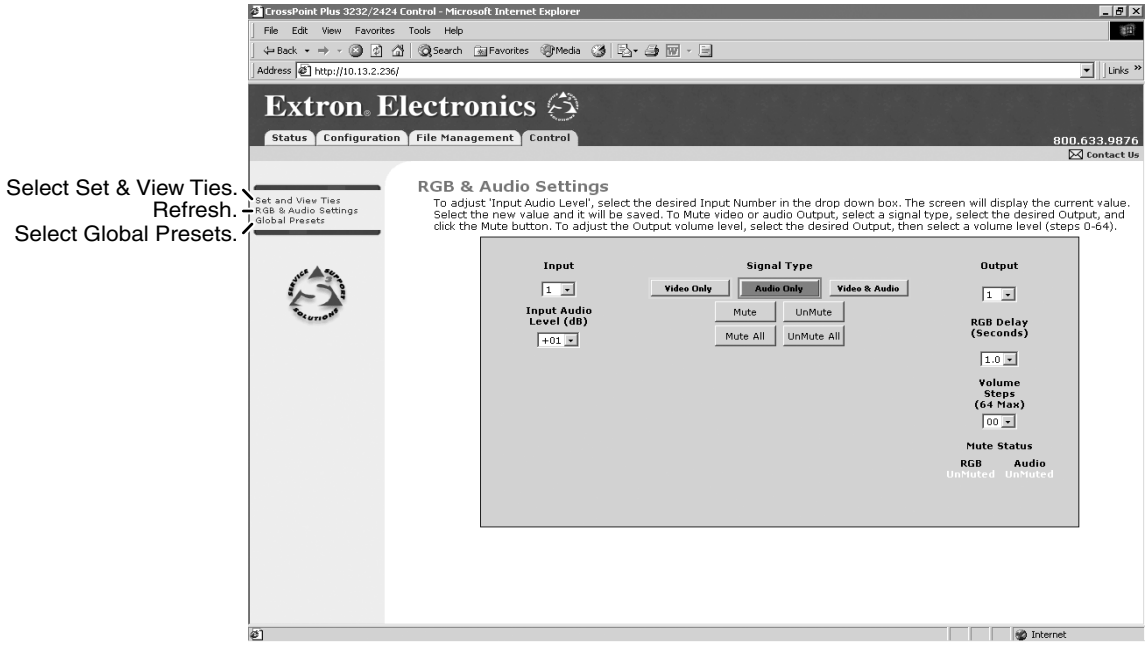

Select Set & View Ties.
Refresh.
Select Global Presets.
CrossPoint Plus 3232/2424 Control - Microsoft Internet Explorer
Extron Electronics
Status
Configuration
File Management
Control
800.633.9876
Contact Us
Set and View Ties
RGB & Audio Settings
Global Presets
RGB & Audio Settings
To adjust 'Input Audio Level', select the desired Input Number in the drop down box. The screen will display the current value. Select the new value and it will be saved. To Mute video or audio Output, select a signal type, select the desired Output, and click the Mute button. To adjust the Output volume level, select the desired Output, then select a volume level (steps 0-64).
Input
Signal Type
Output
Video Only
Audio Only
Video & Audio
Input Audio Level (dB)
Mute
UnMute
Mute All
UnMute All
RGB Delay (Seconds)
Volume Steps (64 Max)
Mute Status
RGB
Audio
UnMuted
UnMuted
Internet

Figure 6-11 — RGB and Audio Settings page

Changing the input gain and attenuation

Users can set each input's level of audio gain or attenuation (-18 dB to +24 dB) from the RGB and Audio Settings page. Audio levels can be adjusted so there are no noticeable volume differences between sources.

Change an input's audio level setting as follows:

1. Click the Input drop box. A drop-down scroll box appears (figure 6-12).

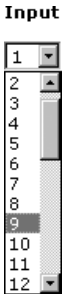


Figure 6-12 — Input selection drop box

2. Click and drag the slider or click on the scroll up button or the scroll down button until the desired input is visible.
3. Click the desired input.
4. Click the Input Audio Level (dB) drop box. A drop-down scroll box appears (figure 6-13).

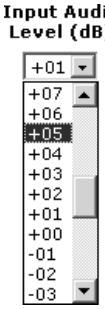


Figure 6-13 — Gain drop box

5. Click and drag the slider or click on the scroll up button or scroll down button until the desired input is visible.
6. Click the desired gain or attenuation value.

Muting and unmuting one or all outputs

Mute one or all outputs as follows:

1. **To select an individual output to mute or unmute**, click the Output drop box. A drop down scroll box appears (figure 6-14).

Figure 6-14 — Output selection drop box

2. Click and drag the slider or click the scroll up button or the scroll down button until the desired output is visible.
3. Click the desired output.
4. Click the *Video, Audio*, or *Follow* button to select video, audio, or both for muting or unmuting. Each mouse click on a button toggles the other two buttons off.
5. Click the *Mute* or *UnMute* button to mute or unmute the selected output.

   Click the *Mute All* or *UnMute All* to mute or unmute all of the outputs.

   Observe the Mute status indications on the page (figure 6-15). Unmuted is displayed in green and muted is displayed in red.

Figure 6-15 — Mute status indications

Changing the RGB delay

The RGB delay interval defines how long the screen is blanked when switching to a new input for the selected output.

Change the RGB delay as follows:

1. Click the Output drop box. A drop-down scroll box appears (figure 6-16).

Figure 6-16 — Output selection drop box

2. Click and drag the slider or click on the scroll up button or the scroll down button until the desired output is visible.
3. Click the desired output.
4. Click the RGB delay drop box. A drop-down scroll box appears (figure 6-17).

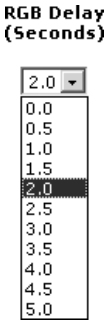


Figure 6-17 — RGB delay drop box

5. Click the desired RGB delay.

Changing the output volume level

Users can set each output's volume level through a range of zero steps of attenuation (full attenuation, minimum volume) to 64 steps of attenuation (no attenuation, full volume) from the RGB and Audio Settings page.

Change an output's audio level setting as follows:

1. Click the output drop box. A drop-down scroll box appears (figure 6-18).

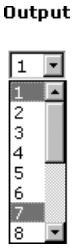


Figure 6-18 — Output selection drop box

2. Click and drag the slider or click the scroll up button or the scroll down button until the desired output is visible.
3. Click the desired output.
4. Click the Volume Steps (64 Max) drop box. A drop-down scroll box appears (figure 6-19).

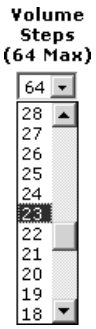


Figure 6-19 — Volume drop box

5. Click the desired output volume step value.

NOTE *The table on the next page defines the value of each audio volume step.*

Audio volume adjustment settings

Number of steps	dB of attenuation	Output volume	Number of steps	dB of attenuation	Output volume	Number of steps	dB of attenuation	Output volume
00	98	0%						
01	63	5.5%	23	41	38.5%	45	19	71.5%
02	62	7%	24	40	40%	46	18	73%
03	61	8.5%	25	39	41.5%	47	17	74.5%
04	60	10%	26	38	43%	48	16	76%
05	59	11.5%	27	37	44.5%	49	15	77.5%
06	58	13%	28	36	46%	50	14	79%
07	57	14.5%	29	35	47.5%	51	13	80.5%
08	56	16%	30	34	49%	52	12	82%
09	55	17.5%	31	33	50.5%	53	11	83.5%
10	54	19%	32	32	52%	54	10	85%
11	53	20.5%	33	31	53.5%	55	9	86.5%
12	52	22%	34	30	55%	56	8	88%
13	51	23.5%	35	29	56.5%	57	7	89.5%
14	50	25%	36	28	58%	58	6	91%
15	49	26.5%	37	27	59.5%	59	5	92.5%
16	48	28%	38	26	61%	60	4	94%
17	47	29.5%	39	25	62.5%	61	3	95.5%
18	46	31%	40	24	64%	62	2	97%
19	45	32.5%	41	23	65.5%	63	1	98.5%
20	44	34%	42	22	67%	64	0	100%
21	43	35.5%	43	21	68.5%			
22	42	37%	44	20	70%			

Global Presets page

You can save and recall global presets from the Global presets page (figure 6-20). Access the Global presets page by clicking the *Global Presets* link on the left of the Control page.

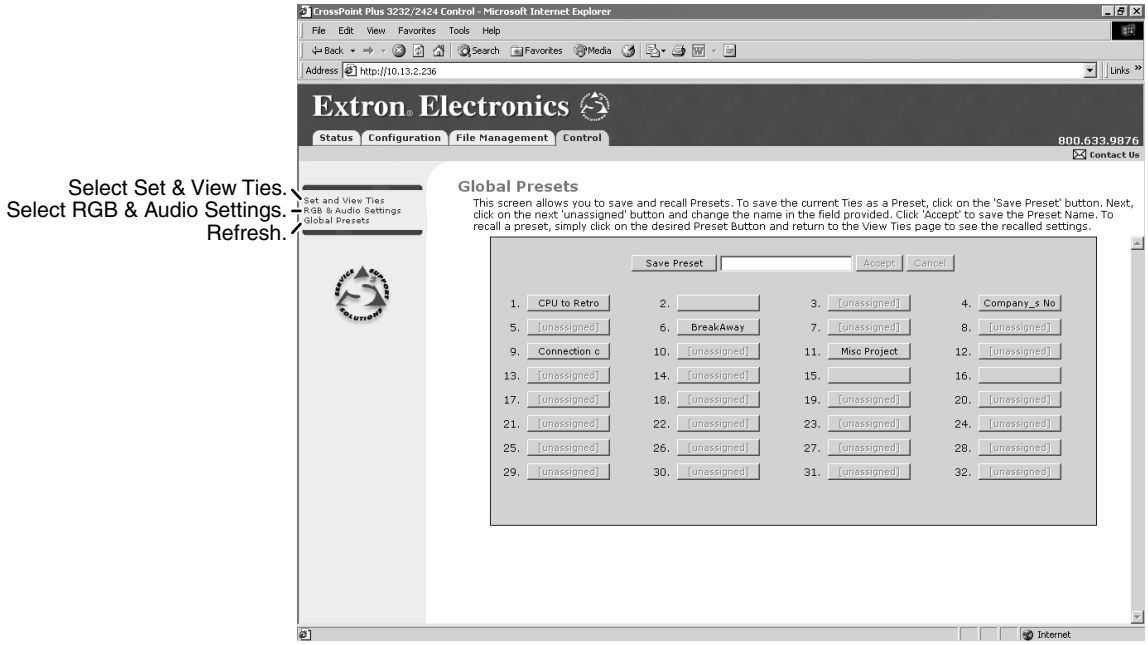


Figure 6-20 — Global Presets page

Saving a preset

Save the current configuration (configuration 0) as a preset as follows:

1. Click the *Save Preset* button.
2. Select the desired preset by clicking on one of the presets listed. To create a new preset, click one of the *[unassigned]* buttons. Overwrite an existing preset by clicking an already existing preset.
3. If desired, type over the current name in the box adjacent to the *Save Preset* button.

NOTE *Preset names are limited to 12 upper and lower case alphanumeric characters and the {space} _ : = and / characters.*

NOTE *The following characters are invalid in preset names:* + ~ , @ = ' [ ] { } < > ' " ; : | \ *and ?.*

If you do not rename an unassigned button, the MVX 128 switcher names the preset as Preset {next available number}.

If you do not rename an existing preset when it is overwritten, the MVX 128 switcher retains the same name.

4. Click the *Accept* button.

Recalling a preset

To recall a global preset to be the current configuration, click the button associated with the desired preset.

Special Characters

The HTML language reserves certain characters for specific functions. The switcher does not accept these characters as part of preset names, the switcher's name, passwords, or locally created file names.

The switcher rejects the following characters:
{space} + ~ , @ = ‘ [ ] { } < > ’ “ semicolon (;) colon (:) | \ and ?.

Appendix A

Ethernet Connection

Ethernet Link

Subnetting — A Primer

Ethernet Connection

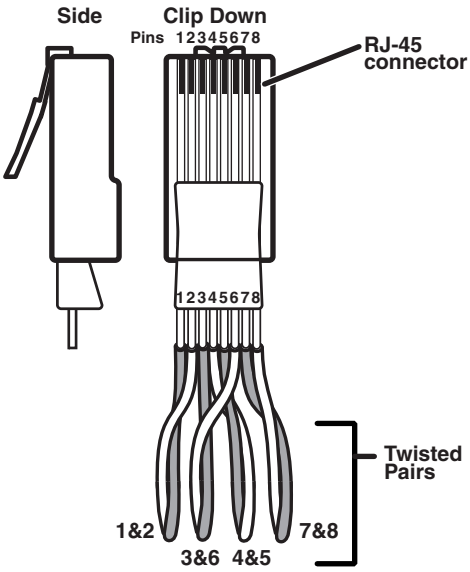
Ethernet Link

The rear panel Ethernet connector on the MVX Plus 128 switcher can be connected to an Ethernet LAN or WAN. This connection makes SIS control of the switcher possible using a computer connected to the same LAN.

Ethernet connection

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (figure A-1).

- **Crossover cable** — Direct connection between the computer and the MVX Plus 128 switcher.
- **Patch (straight-through) cable** — Connection of the MVX Plus 128 switcher to an Ethernet LAN.



Patch (straight) cable

Side 1		Side 2	
Pin	Wire color	Pin	Wire color
1	White-orange	1	White-orange
2	Orange	2	Orange
3	White-green	3	White-green
4	Blue	4	Blue
5	White-blue	5	White-blue
6	Green	6	Green
7	White-brown	7	White-brown
8	Brown	8	Brown

Crossover cable

Side 1		Side 2	
Pin	Wire color	Pin	Wire color
1	White-orange	1	White-green
2	Orange	2	Green
3	White-green	3	White-orange
4	Blue	4	Blue
5	White-blue	5	White-blue
6	Green	6	Orange
7	White-brown	7	White-brown
8	Brown	8	Brown

Figure A-1 — RJ-45 connector pinout tables

Default address

To access the MVX Plus 128 switcher via the Ethernet port, you need the switcher's IP address. If the address has been changed to an address comprised of words and characters, you can determine the actual numeric IP address using the Ping utility. If the address has not been changed, the factory-specified default is 192.168.254.254.

Ping can also be used to test the Ethernet link to the MVX Plus 128 switcher.

Pinging to determine Extron IP address

The Microsoft Ping utility is available at the DOS prompt. Ping tests the Ethernet interface between the computer and the MVX Plus 128 switcher. Ping can also be used to determine the actual numeric IP address from an alias and to determine the web address.

Ping the switcher as follows:

1. On the Windows task bar, click on *Start* > *Run*.
2. At the Open prompt, type *command.*
3. Click the *OK* button.
4. At the DOS prompt, type *ping {IP address}* and then press [Enter]. The computer returns a display similar to figure A-2.

   The line **Pinging ...** reports the actual numeric IP address, regardless of whether you entered the actual numeric IP address or an alias name.

```
C:\>ping 192.168.254.254

Pinging 192.168.254.254 with 32 bytes of data:

Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128

Ping statistics for 192.168.254.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Figure A-2 — Ping response

Pinging to determine Web IP address

The Ping utility has a modifier, *-a*, that directs the command to return the Web address rather than the numeric IP address.

At the DOS prompt, type *ping -a {IP address}* and then press [Enter]. The computer's return display is similar to the Ping response shown in figure A-2, except that when you specify the *-a* modifier, the line **Pinging mail...** reports the web IP address rather than the numeric IP address, regardless of whether you entered the actual numeric IP address or an alias name.

Connecting as a Telnet client

The Microsoft Telnet utility is available from the DOS prompt. Telnet allows you to input SIS commands to the MVX Plus 128 switcher from the PC via the Ethernet link and the LAN.

Access the DOS prompt and start Telnet as follows:

1. On the Windows task bar, click on *Start > Run*.
2. At the Open prompt, type *command*.
3. Click the *OK* button.
4. At the DOS prompt, type *telnet* and then press [Enter]. The computer returns a display similar to figure A-3.

```
Microsoft (R) windows 2000 (TM) Version 5.0 (Build 2195)
Welcome to Microsoft Telnet Client
Telnet Client Build 5.00.99203.1

Escape Character is 'CTRL+]'

Microsoft Telnet>
```

Figure A-3 — Telnet screen

Telnet tips

It is not the intention of this manual to detail all of the operations and functionality of Telnet; however, some basic level of understanding is necessary for operating the MVX Plus 128 switcher via Telnet.

Open

Connect to the MVX Plus 128 switcher using the Open command. Once you are connected to the switcher, you can enter the SIS commands the same as you would if you were using the RS-232 link.

Connect to the MVX Plus 128 switcher as follows:

1. At the Telnet prompt, type *open {IP address}* and then press [Enter].

   If the switcher is not password protected, no further prompts are displayed until you break or disconnect the connection to the MVX Plus 128 switcher.

   If the switcher is password protected, Telnet displays the password prompt.

2. If necessary, at the password prompt, type *{password}* and then press [Enter].

   Connection to the switcher via the Ethernet can be password protected. There are two levels of password protection: administrator and user. A person logged on as an administrator has full access to all MVX Plus 128 switching capabilities and editing functions. Users can select video and/or audio for output, select test patterns, set RGB and audio mutes, select a blue screen, and view all settings with the exception of passwords. By default, the MVX Plus 128 switcher ships with both passwords set to {carriage return}.

Once you are logged in, the switcher returns either **Login Administrator** or **Login User**. No further prompts are displayed until you break or disconnect the connection to the MVX Plus 128 switcher.

Escape character and Esc key

When Telnet is first started, the utility advises that the **Escape character is 'Ctrl+]'**. Many SIS commands include the keyboard Esc key. Consequently, some confusion may exist between the Escape character and the Escape key.

The Telnet Escape character is a key combination, the Ctrl key and the] key pressed simultaneously, that returns you to the Telnet prompt while leaving the connection to the MVX Plus 128 switcher intact.

The Escape key is the Esc key on the computer keyboard.

Local echo

Once connected to the MVX Plus 128 switcher, by default, Telnet does not display your keystrokes on the screen. SIS commands are typed in blindly and only the SIS responses are displayed on the screen. To command Telnet to show keystrokes, at the Telnet prompt, type *set local_echo* and then press [Enter] before you open the connection to the switcher.

With local echo turned on, keystrokes and the switcher's responses are displayed on the same line. For example: **1*1!In1 Out1 All,** where **1*1!** is the SIS command and **In1 Out1 All** is the response.

With local echo turned on, all keystrokes are displayed, even those that should be masked, such as the password entry. For example, when entering a password with local echo turned on, you see a display such as **a*d*m*i*n***, where **admin** is the keyed in password and ***** is the masked response.

You can turn off local echo by typing *unset local_echo* and then pressing [Enter] at the Telnet prompt. If you are connected to the MVX Plus 128 switcher and need to access the Telnet prompt to turn local echo off, type the Escape character (Ctrl+]).

Set carriage return-line feed

Unless commanded otherwise, Telnet transmits a line feed character only (no carriage return) to the connected switcher when you press the Enter key. This is the correct setting for SIS communication with the switcher. The Telnet *set crlf* command forces Telnet to transmit carriage return and line feed characters when Enter is pressed, but if crlf is set, the SIS link with the switcher does not function properly.

Close

To close the link to the switcher, access the Telnet prompt by typing the Escape character (Ctrl+]). At the Telnet prompt, type *close* and then press [Enter].

Help

For Telnet command definitions, at the Telnet prompt, type *?* and then press [Enter].

Quit

Exit the Telnet utility by typing *quit* and then pressing [Enter] at the Telnet prompt. If you are connected to the MVX Plus 128 switcher, access the Telnet prompt by typing the Escape character (Ctrl+]).

Subnetting — A Primer

It is not the purpose of this manual to describe TCP/IP protocol in detail. However, some understanding of TCP/IP subnetting (a subnet is a **sub**set of a **net**work — a set of IP devices that have portions of their IP addresses in common) is necessary in order to understand the interaction of the MVX Plus 128 switcher and the mail server gateway. To understand subnetting at the level required to install and operate the MVX Plus 128 switcher, you must understand the concepts of a gateway, local and remote devices, IP addresses and octets, and subnet masks and octets.

Gateways

The MVX Plus 128 switcher can communicate with the e-mail server that the switcher uses for e-mail notification directly (if they are on the same subnet) or the communication can be routed via a gateway (a computer that provides a link between different subnets).

Local and remote devices

The local and remote devices are defined from the point of view of the function being described. In this manual, subnetting is an issue when you are using the controlling PC to set TCP/IP and e-mail values in the MVX Plus 128 switcher (see *IP Settings/Options window* in chapter 5, *Matrix Software*, and *Email Settings page* in chapter 6, *HTML Operation*). When you are setting up the variables for e-mail notification, which may include subnetting, the matrix switcher is the local device and the e-mail server is the remote device.

IP addresses and octets

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields, properly called octets, separated by dots (periods) (figure A-4). Each octet can be numbered from 000 through 255. Leading zeroes, up to three digits total per octet, are optional. Values of 256 and above are invalid.

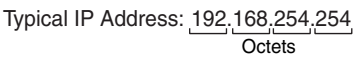


Figure A-4 — IP address and octets

Subnet masks and octets

The subnet mask (figure A-5) is used to determine whether the local and remote devices are on the same subnet or different subnets. The subnet mask consists of four numeric octets separated by dots. Each octet can be numbered from 000 through 255. Leading zeroes, up to three digits total per octet, are optional. Each octet typically contains either 255 or 0. The octets determine whether or not the same octets of two IP addresses will be compared when determining if two devices are on the same subnet.

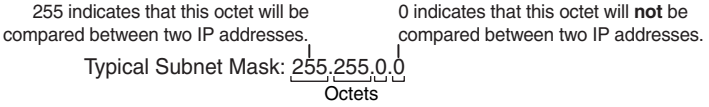

255 indicates that this octet will be compared between two IP addresses.
0 indicates that this octet will **not** be compared between two IP addresses.
Typical Subnet Mask: 255.255.0.0
Octets

Figure A-5 — Subnet mask and octets

Determining whether devices are on the same subnet

To determine the subnet, the local device's IP address is **compared** to the remote device's IP address (figure A-6). Each address's octets are **compared** or **not compared**, depending on the value in the related subnet mask octet.

- If a subnet mask octet contains the value 255, the related octets of the local device's address and the remote device's IP address are unmasked.

  Unmasked octets are compared (indicated by ***?*** in figure A-6).

- If the subnet mask octet contains the value 0, the related octets of the local device's and remote device's IP addresses are masked.

  Masked octets are not compared (indicated by ***X*** in figure A-6).

If the unmasked octets of the two IP addresses **match** (indicated by **=** in figure A-6) (example 1), the two addresses **are on the same subnet**.

If the two unmasked fields **do not match** (indicated by ≠ in figure A-6) (example 2 and example 3), the addresses **are not on the same subnet**.

	Example 1	**Example 2**	**Example 3**
Local IP Address:	192.168.254.254	192.168.254.254	192.168.254.254
Subnet Mask:	255.255.0.0 (*?.?.X.X)*	255.255.0.0 (*?.?.X.X)*	255.255.0.0 (*?.?.X.X)*
Remote IP Address:	192.168.2.25	190.190.2.25	192.190.2.25
Match?:	=.=.*X.X* — **Match** (Same subnet)	≠.≠.*X.X* — **No match** (Different subnet)	=.≠.*X.X* — **No match** (Different subnet)

Figure A-6 — Comparing the IP addresses

Ethernet Connection, cont'd

B

Appendix B

Specifications, Part Numbers, Accessories

Specifications

Part Numbers and Accessories

Button Labels

Specifications, Part Numbers, Accessories

Specifications

Video

Routing	12 x 8 matrix
Gain	Unity
Bandwidth	>300 MHz (-3 dB) , fully loaded 0 - 10 MHz .....no more than +0.1 dB to -0.1 dB 0 - 130 MHz .....no more than +0.8 dB to -0.8 dB
Crosstalk	-80 dB @ 1 MHz, -55 dB @ 10 MHz, -45 dB @ 30 MHz, -37 dB @ 100 MHz
Switching speed	200 ns (max.)

Video input

Number/signal type	12 RGBHV, RGBS, RGsB, RsGsBs, HDTV component video, component video, S-video, composite video
Connectors	12 female 15-pin HD
Nominal level	1 Vp-p for Y of component video and S-video, and for composite video 0.7 Vp-p for RGB 0.3 Vp-p for R-Y and B-Y of component video, and for C of S-video
Minimum/maximum levels	Analog: 0.5 V to 2.0 Vp-p with no offset
Impedance	75 ohms
Return loss	<-30 dB @ 5 MHz
DC offset (max. allowable)	1.5 V

Video output

Number/signal type	8 RGBHV, RGBS, RGsB, HDTV component video, component video, S-video, composite video (follows input type)
Connectors	8 female 15-pin HD
Nominal level	1 Vp-p for Y of component video and S-video, and for composite video 0.7 Vp-p for RGB 0.3 Vp-p for R-Y and B-Y of component video, and for C of S-video
Minimum/maximum levels	0 V to 2.0 Vp-p (follows input)
Impedance	75 ohms
Return loss	-30 dB @ 5 MHz
DC offset	±5 mV with input at 0 offset
Switching type	Triple-Action™

Sync

Input type	RGBHV, RGBS, RGsB, RsGsBs
Output type	RGBHV, RGBS, RGsB, RsGsBs (follows input) Tri-level on Y, R-Y, B-Y channels (component video 720p, 1080i, 1080p) Bi-level on Y channel (for all other component video rates)
Input level	0.5 V to 5.0 Vp-p, 4.0 Vp-p normal
Output level	AGC to TTL: 4.0 V to 5.0 Vp-p, unterminated
Input impedance	510 ohms
Output impedance	75 ohms
Max input voltage	5.0 Vp-p
Max. propagation delay	30 ns
Max. rise/fall time	4 ns
Polarity	Positive or negative (follows input)

Audio

Routing	12 x 8 stereo matrix
Gain	Unbalanced output: -6 dB; balanced output 0 dB
Frequency response	20 Hz to 20 kHz, ±0.05 dB
THD + Noise	0.03% @ 1 kHz at nominal level
S/N	>90 dB, balanced, at maximum output (21 dBu), unweighted
Crosstalk	<-80 dB @ 1 kHz, fully loaded
Stereo channel separation	>80 dB @ 1 kHz
CMRR	>75 dB @ 20 Hz to 20 kHz

Audio input

Number/signal type	12 stereo, balanced/unbalanced
Connectors	(12) 3.5 mm captive screw connectors, 5 pole
Impedance	>10k ohm, balanced/unbalanced, DC coupled
Nominal level	0 dBV (316 mV) 0 dBu (775 mV)
Maximum level	+19.5 dBu, (balanced or unbalanced) at 0.01% THD+N
Input gain adjustment	-18 dB to +24 dB, adjustable per input by RS-232/422, Ethernet, or front panel

NOTE *0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV ≈ 2 dBu*

Audio output

Number/signal type	8 stereo, balanced/unbalanced
Connectors	(8) 3.5 mm captive screw connectors, 5 pole
Impedance	50 ohms unbalanced, 100 ohms balanced
Gain error	±0.1 dB channel to channel
Maximum level (Hi-Z)	>+21 dBu, balanced or unbalanced at 0.10%THD+N
Maximum level (600 ohm)	>+15 dBm, balanced or unbalanced at 0.10%THD+N
Output volume range	0 to 64 (-98 dB to 0 dB) in 1 dB increments from steps 1 to 64, 35 dB increment from step 0 to 1

Control/remote — switcher

Serial control port	1 RS-232 or RS-422, 9-pin female D connector
Baud rate and protocol	9600 (default), 19200, 38400, 115200 baud (adjustable); 8 data bits, 1 stop bit, no parity
Serial control pin configurations	RS-232: 2 = TX, 3 = RX, 5 = GND RS-422: 2 = TX-, 3 = RX-, 5 = GND, 7 = RX+, 8 = Tx+
Ethernet control port	1 RJ-45 female connector
Ethernet data rate	10/100Base-T, half/full duplex with autodetect
Ethernet protocol	ARP, DHCP, ICMP (ping), TCP/IP, Telnet, HTTP
Program control	Extron's control/configuration program for Windows® Extron's Simple Instruction Set (SIS™) Microsoft® Internet Explorer, Telnet

General

Power	100 VAC to 240 VAC, 50/60 Hz, 30 watts, internal, autoswitchable
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +113 °F (0 to +45 °C) / 10% to 90%, noncondensing
Rack mount	Yes, with included brackets
Enclosure type	Metal
Enclosure dimensions	3.5" H x 19.0" W x 9.4" D (2U high, full rack wide) 8.9 cm H x 48.3 cm W x 23.9 cm D (Depth excludes connectors. Width includes rack ears.)
Product weight	14.4 lbs (6.5 kg)
Shipping weight	21 lbs (10 kg)
DIM weight, international	25 lbs (12 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Listings	UL, CUL
Compliances	CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE *All nominal levels are at ±10%.*

NOTE *Specifications are subject to change without notice.*

Part Numbers and Accessories

Included parts

These items are included in each order for a MVX Plus 128 matrix switcher:

Included parts	Replacement part number
MVX Plus 128	60-788-01
Tweeker (small screwdriver)	
MVX Plus 128 user's manual	
Captive screw audio connectors (20)	10-319-10
Matrix Switchers+ Control Program and Button-Label Generator	

Accessories

These items can be ordered separately:

Adapters, power supplies, labels	Part number
MKP 1000 remote keypad	
Gray	60-239-01
Black	60-239-02
White	60-239-03
RAL9010 white	60-239-05
WT (water-tight	60-239-51
MCP 1000M (master)	60-298-01
MCP 1000S (slave)	60-298-02
MKP 2000 matrix switcher X-Y remote control panel	
Black	60-682-02
White	60-682-03
RAL9010 white	60-682-05
MKP 3000	
Black	60-708-02
White	60-708-03
RAL9010 white	60-708-05
Button cap and diffuser kit (set of 3 button cap assemblies)	70-352-01

Cables

Male-to-female VGA molded connector cables	Part number
VGA 3′ MHR, 3′ (0.9 m)	26-112-17
VGA 6′ MHR, 6′ (1.8 m)	26-112-15
VGA 15′ MHR, 15′ (4.5 m)	26-112-01
VGA 25′ MHR, 25′ (7.6 m)	26-112-05
VGA 35′ MHR, 35′ (10.6 m)	26-112-28
VGA 50′ MHR, 50′ (15.2 m)	26-112-29
VGA 75′ MHR, 75′ (22.8 m)	26-112-30
VGA 100′ MHR, 100′ (30.4 m)	26-112-31

Male-to-female VGA backshell connector cables	Part number
VGA 3′ MHR, 3′ (0.9 m)	26-112-35
VGA 6′ MHR, 6′ (1.8 m)	26-112-36
VGA 15′ MHR, 15′ (4.5 m)	26-112-37
VGA 25′ MHR, 25′ (7.6 m)	26-112-38
VGA 35′ MHR, 35′ (10.6 m)	26-112-27
VGA 50′ MHR, 50′ (15.2 m)	26-112-02
VGA 75′ MHR, 75′ (22.8 m)	26-112-03
VGA 100′ MHR, 100′ (30.4 m)	26-112-04

Male-to-male VGA molded connector cables	Part number
VGA M3′ MHR, 3′ (0.9 m)	26-238-14
VGA M6′ MHR, 6′ (1.8 m)	26-238-01
VGA M10′ MHR, 10′ (3.0 m)	26-238-07
VGA M15′ MHR, 15′ (4.5 m)	26-238-02
VGA M25′ MHR, 25′ (7.6 m)	26-238-03
VGA M35′ MHR, 35′ (10.6 m)	26-238-17
VGA M50′ MHR, 50′ (15.2 m)	26-238-18
VGA M75′ MHR, 75′ (22.8 m)	26-238-19
VGA M100′ MHR, 100′ (30.4 m)	26-238-20

Male-to-male VGA molded connector cables	Part number
VGA M3′ MHR, 3′ (0.9 m)	26-238-24
VGA M6′ MHR, 6′ (1.8 m)	26-238-25
VGA M10′ MHR, 10′ (3.0 m)	26-238-26
VGA M15′ MHR, 15′ (4.5 m)	26-238-27
VGA M25′ MHR, 25′ (7.6 m)	26-238-28
VGA M35′ MHR, 35′ (10.6 m)	26-238-16
VGA M50′ MHR, 50′ (15.2 m)	26-238-04
VGA M75′ MHR, 75′ (22.8 m)	26-238-05
VGA M100′ MHR, 100′ (30.4 m)	26-238-06

Button Labels

Page B-9 provides strips of blank button labels. If desired, photocopy them or cut them out of the manual, write button information in each button area as desired, and put them in the switcher's input or output buttons' windows. You can also create labels using the Button-Label Generator software (see chapter 5, *Matrix Software*).

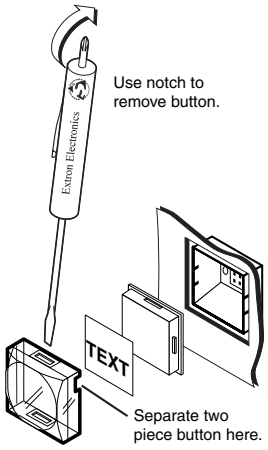
Installing labels in the matrix switcher's buttons

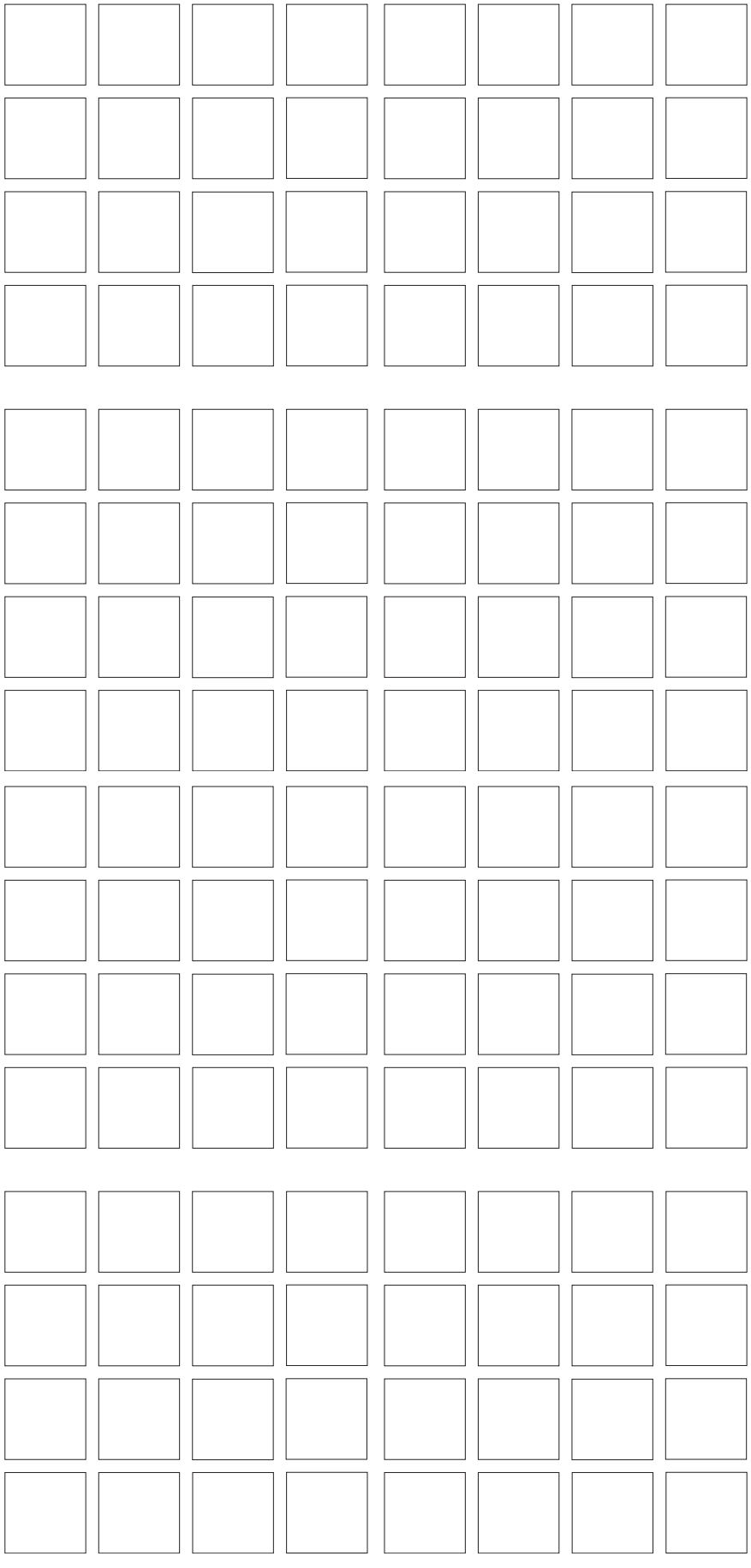
Use the following procedure to install new labels in the matrix switcher's front panel buttons.

1. Make new labels using either the blanks on page B-9 or the Button-Label Generator software. Cut them out.
2. Remove the button from the switcher by grasping the button firmly and pulling it away from the front panel.

NOTE *There are different button models available. Your buttons **may** appear different.*

3. Use a small screwdriver or Extron Tweeker to gently lever the button cap off of the white backing plate.
4. Insert a button label into the cap and gently but firmly press the cap onto the white backing plate.
5. Press the button into place in the matrix switcher





Button label blanks

FCC Class A Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Note: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron Electronics
1001 East Ball Road
Anaheim, CA 92805, USA

Europe, Africa, and the Middle East:

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Asia:

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363

Japan:

Extron Electronics, Japan
Kyodo Building
16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

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